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NEWSPAPER

The Big Top Takes Over The Big Apple

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – The National Computer Conference rolled through here last week complete with circuses, calliopes, card sharks and horse-drawn cabs.

Users and industry people – 34,000 in all – showed up for the three-ring affair which featured a ringmaster, technical sessions covering all phases of the trade and the largest exhibition since the industry's golden days of 1969.

They came from all corners of the U.S., Europe and Asia. One attendee even rode a bike from New Hampshire.

The exhibit hall in this hot and muggy city reverberated with the clacking of printers, which seemed to be everywhere on the three floors of the Coliseum.

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CW Photo by A. Dooley

"Ladies and Gentlemen, Girls and Boys:" Data General's Ringmaster welcomes NCC Visitors.

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NCC '76 Speakers Stress DP Responsibilities

Dynamic Growth Seen Continuing

By Nancy French
Of the CW Staff

NEW YORK – If aviation had evolved at the speed computers have, Neil Armstrong – or his father – would have walked on the moon less than a year after the Wright brothers took off from Kitty Hawk, J. Paul Lyet, Univac chairman and chief executive officer, said here last week.

Addressing the keynote session of the National Computer Conference (NCC), Lyet said the user who spent $42 for 5 million computations in three minutes in the early 1950s today spends less than half a cent for the same answers in 1/80th of a second.

In the 25 years that have passed since the first commercial computer was shipped to a customer, the computer has touched more lives and more institutions than any other invention. "The science fiction of 1951 is today a part of everyday life, no longer a costly convenience, but a necessity," he said.

As for the next 25 years, Lyet sees still more growth. The 1.3 million computer terminals in use in the U.S. will explode to 8 million, he predicted, and "the com-

(Continued on Page 2)

Societies Called 'Sleek and Fat'

By Edith Holmes
Of the CW Staff

NEW YORK – "Sleek and fat," computer practitioners and their professional societies have not assumed the responsibilities to society at large that go along with the increasing importance of computing, according to Anthony Ralston, outgoing president of the American Federation of Information Processing Societies (Afips) and professor of computer science at the State University of New York at Buffalo.

Addressing a plenary session entitled "The Computer Profession" at the National Computer Conference (NCC) here last week, Ralston urged computing's professional societies and their members to go beyond purely technical questions and problems.

For example, they could provide nonpartisan technical assistance in legal struggles – in particular to the judge hearing the U.S. government's antitrust action agasint IBM.

Afips' 15 constituent societies should also continue talking about and publishing professional codes of ethics, he said, but they should stop their efforts to enforce these. Trying to enforce such codes won't accomplish anything, Ralston argued, when the real determiner of ethical standards is society at large.

Finally, professional societies and individual practitioners of computing should promote scientific freedom generally and in the USSR particularly by refusing to support and attend conferences held in countries where science is controlled by politics, Ralston said.

"We in computing are lagging seriously behind our colleagues in other scientific areas" in taking stands beyond technical matters, he said. "We are untroubled by the recent recession and look forward to the future growth of our industry – just look at the exhibits over in the [New York] Coliseum," he added.

Scientific Aristocrats

"We in computing are the aristocracy of science and technology today," according to Ralston, who likened the profession's position to that of physics right after World War II. "But we aren't discussing the interfaces between the profession and society at large as much as we should be at conferences like this."

Taking issues "that are only partly technical and so not easily debugged" as his

(Continued on Page 8)

Product Parade Greets Exhibit Visitors

• Minicomputers

By Esther Surden
Of the CW Staff

NEW YORK – Small business systems based on already introduced processors led the list of minicomputer systems announced at NCC this time around.

Showgoers here last week also met another member of an existing processor family, saw a computer on a board from a major mini maker and were teased by a hint of a small business system that should be available next year.

One of the systems based on an already introduced CPU was Microdata Corp.'s Express family of OEM systems for distributed processing applications. The Express line features microprogramming and stack architecture, a spokesman said.

Languages available on the system, which utilizes the firm's 32S processor, include Fortran IV, Cobol, Basic and Microdata's Express Programming Lan-

(Continued on Page 4)

• Communications

By Ronald A. Frank
And John P. Hebert
Of the CW Staff

NEW YORK – Data communications users found a liberal sprinkling of products and services at NCC here last week.

AT&T had an on-line demonstration of its proposed Dataphone Switched Digital Service (DSDS) now pending before the Federal Communications Commission (FCC). Using the 821A manual call controller with Switched Digital Service Units, Ascii messages were transmitted at 56 kbit/sec to a DSDS switch at an AT&T central office in New York. From there messages were switched to a Digital Equipment Corp. PDP-9 at Bell Laboratories, in Holmdel, N.J.

Responses were displayed on a Video Systems Corp. CRT in the AT&T booth on the exhibition floor. Inquiries transmitted to the PDP-9 were answered on

(Continued on Page 4)

• Systems

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – New products for the large systems user were few and far between here last week as introductions became almost the exclusive preserve of the mini and communications equipment vendors at NCC.

The traditional plug-compatible peripherals makers were well represented on the floor, but few new products were in evidence. The mainframers were represented by IBM, Burroughs Corp., Control Data Corp. and Univac; however, the only new mainframe to bow at the conference was the Univac 90/80 [CW, June 7].

The major action for the larger shops occurred at both ends of the DP spectrum – data entry and output, particularly printers.

One firm – Sycor, Inc, – combined both of these trends by adding a printer

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Ink Jet Printer Also Bows

IBM System 32 Gets Word Processing

By Ronald A. Frank
Of the CW Staff

NEW YORK – IBM added word processing capabilities to its System 32 along with an ink jet printer during NCC last week, but none of the products were shown on the exhibit floor.

Using a program product called Word Processor 32, the company added features that allow the desk-size CPU to automatically generate, revise and format documents.

The program is implemented with the 5321 magnetic card unit allowing the 32 to accept inputs from IBM magnetic card typewriters, the company said. Word processing enhancements also include an upgraded System Control Program which features upper- and lower-case and half-space printing; plus upper- and lower-case keyboard/display capabilities.

CW At NCC

As part of the System 32 introduction, IBM also added its first ink jet printer which operates at 92 char./sec and has automatic paper handling, magnetic card input, formatting capabilities and optional communications capabilities.

Called the 46/40 document printer, the unit includes an automatic envelope sheet feed mechanism and magnetic card read capability. Information recorded on magnetic cards can be transmitted from one 46/40 to another or to a CPU at speeds ranging from 600- to 2,400 bit/sec in Ebcdic; Ascii; or Texcode, used by IBM magnetic card typewriters.

The 46/40 includes a 6,600-character text buffer and it has an internal stored program contained in read-only storage modules that are said to require no program loading.

The 46/40 costs $760/mo or $29,000. The communications feature costs $135/mo or about $5,500. First deliveries are scheduled for October.

The 5321 magnetic card unit will be available in November for $10,200 or $255/mo. The enhanced System Control Program is available free. The upper- and lower-case printing and keyboard/display features are $170/mo and $25/mo respectively. All of the 32 enhancements are also available under various IBM lease plans.

Growth Predicted to Continue

(Continued from Page 1)

puter, through terminals, will be as much a part of the office as today's typewriter."

Today's frustrations in every part of our society will be tomorrow's computer applications, he said, adding that today computer systems are being used in only about 10% of the potential applications.

Today, computer communications services used by the general public are a $100 million market. In another 10 years or so, that market will have exploded 100-fold to $10 billion. By 1990, it will double to $20 billion.

It is not the opportunities for exciting new growth, however, but the constraints that Lyet said concerned him.

Communication is one of those constraints, he said. "If computers are to be the important part of the future society I described, we have got to bring the public into the act," he said.

DPers should help eliminate the mystique, the acronyms, the buzzwords – to find better and clearer ways to communicate the benefits of the computer to potential, nontechnical users, who represent the largest-yet untapped market.

"The constraint to future industry growth which worries me the most is people," he said. Some are working so hard solving today's very demanding problems they fail to address the even larger and more complex technical challenges of tomorrow.

"What we have seen in the past 25 years has not been computer progress, but rather people progress – the sum of individual achievements of the professional men and women who work for the industry," he said.

The industry's growth potential over the next 25 years is dependent upon individuals' investing in themselves by constantly learning and exchanging ideas.

Business constraints are also a concern, Lyet said. Among them he cited present U.S. tax structure that increases rather than eases the difficulty of raising equity capital and European trade barriers that give preferential treatment to domestic companies.

"The computer industry needs about $1 of assets for each $1 of revenue," he said. "That's more than can be generated from computer earnings alone, and borrowing all the rest creates financial imbalance."

Recent efforts by European countries to develop their own computers to the exclusion of U.S. computers constitute competitive restraints, he said. "What started out to be an anti-IBM measure ended up being anti-Burroughs, anti-Honeywell and anti-Univac as well."

Univac has been partly responsible for some protective actions taken by certain foreign countries "through our past refusal to permit local ownership participation, through lack of sensitivity to very real motivations of national pride and status and through a belief that we can remain technologically superior and self-sufficient indefinitely."

Univac has changed its attitude, however, and now has entered into joint ventures in some European countries with considerable success.

Voters' Choice

NEW YORK – Jimmy Carter will stomp for the Democrats next fall as Gerald Ford barnstorms the country to keep his seat in the Oval Office.

At least that's what NCC attendees hope will happen, according to a Presidential preference poll run on the exhibition floor by Bourns Management Systems.

Attendees were given the chance to list their choices on a ballot which was scanned by an optical mark reader for input to a CPU. At mid-week the results closely paralleled those of the last primary contests, which were held during the show.

In the Democratic race for the nomination, Carter led with 396 votes, Sen. Hubert H. Humphrey was next with 86 and California Gov. Edmund G. Brown came in third with 79.

Ford, with 433 votes, swamped Ronald Reagan's 138 votes to grab the Republican nomination.

In the area of campaign issues, attendees said the economy is the most important issue, with honest politics running a close second.

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Decisions

"Okay, Whitlow, you've marketed 1,000 SyncSorts. Now would you like to try for 2,000?"

(Sure. If IBM keeps making hardware, how can we miss?)

Call (201) 568-9700

If the question is sorting, the answer is SyncSort.

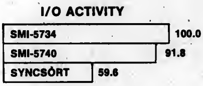
Sometimes we almost feel like Archimedes. It's as though we've discovered a natural law of our own.

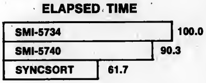
Even the Ph.D.'s around our place regard our discovery with a certain amount of awe. They refer to it, in hushed tones, as the "SyncSort Factor."

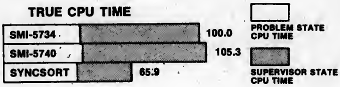
It's a progression that goes something like this:

1. IBM will continue to make and market computers. (That seems like a safe $2 bet.)
2. The busy people who use these computers will naturally require the best sort package they can obtain. (Sorting is the most frequent job on any commercial computer.)
3. These people — being intelligent men and women — will sooner or later find their way to SyncSort III-and-a-half. (It's the best sort package on the market.)
4. None of the foregoing will harm our business. (We will continue to update our package so that it will always stay ahead of the competition.)
5. This will lead to more sales and more improvements. (Maybe we should call our discovery the "Law of Perpetual Sorting Improvement!")

If you'd like a graphic representation of the "SyncSort Factor" take a look at the picture below. These graphs depict what happens when you match SyncSort III-and-a half against other sorts on the market today:







Performance is, of course, the bottom line in sorting. But it's not the only thing you should consider in choosing a sort package. Is the sort versatile, for example? Will it support 3350 devices in their native mode without having to sysgen a new system? SyncSort III-and-a-half *will*.

And how's the sort support? Will anybody help you phase the package in when you start using it? If you call the other supplier with a tricky little question, will there be anybody there willing to take the time and effort to give you a reasonable answer?

We will. In fact, we *like* receiving questions from users. It's a hangover from the days when we were pioneering all those developments that opened up the sorting industry. Once an explorer, always an explorer!

The foregoing are some reasons why SyncSort has been so successful in penetrating its market. (In fact, we think we may have obtained a bigger slice of our market than any other software product.)

So we don't see 2,000 users as an impossible goal. Not unless nature repeals the "SF." Or IBM goes out of business.

OVERSEAS REPRESENTATIVES —

London, Paris, Dusseldorf, Brussels — (Gemini Computer Systems), Rijswijk (ZH) — (PANDATA), Madrid — (Entel/Ibermatica), Vienna — (Ratio), Sao Paulo — (Deltacom Do Brasil), Melbourne — (The Shell Company of Australia, Limited),

WHITLOW
COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Many Minis Introduced at NCC Based on Older CPUs

(Continued from Page 1)

guage, which is based on PL/1.

The system can accommodate up to 512K words of main memory in 32K-word increments. Writable control memory and floating point are optional.

The Express I includes a CPU with 32K words of memory, a 10M-byte disk system, a tape cartridge system also introduced here, a console display and a line printer interface for medium- to low-speed printers.

The system can support up to eight users with interactive or batch processing and can be expanded to include additional disk storage to 50M bytes, one more tape cartridge drive, a card reader and an additional 32K words of memory.

Express I costs $19,950 in single quantities and is discountable to 25%.

The Express II comes with either cartridge tape or IBM-compatible magnetic tape systems. A basic system package includes a 32K CPU, 50M-byte disk drive, tape cartridge system with two drives, console CRT and 120 line/min printer.

The Express II costs $27,650 in large quantities. Microdata is at 17481 Red Hill Ave., Irvine, Calif. 92714.

The Power series of small business systems from Digital Computer Controls, Inc. is based on that firm's existing minicomputers.

The 1000 series with 24K of memory, 256K-word dual floppy disk system CRT, 100 char./sec printer, desk enclosure and the firm's Extended Operating System sells for under $16,000.

The 2000 contains all features of the 1000 but adds 2.5M bytes of disk and a 330 char./sec printer. Based on the firm's Mod Five, it costs under $24,000.

The 3000, based on the 616 mini, has 5M bytes of disk and a 330 char./sec printer and costs $32,000.

The systems are geared to both end users and OEMs, DCC said. The firm is at 12 Industrial Road, Fairfield, N.J. 07006.

Four-Phase Systems, Inc. brought a 24-station, Cobol-programmed distributed processing system to NCC.

The IV/50 was designed for remote use with the firm's family of Network Transaction Processing software products. It supports 24 CRTs.

A typical IV/50 with 12 CRTs, 72K CPU, decimal arithmetic, 10M-byte disk, 354K-byte diskette and bisynchronous communications costs $1,335/mo on a 42-month lease including maintenance.

The firm's IV/40 was enhanced to offer a 10M-byte fixed disk. Monthly rental for a IV/40 system with 24K bytes of memory, four displays, 10M bytes of disk, a 354K-byte diskette and IBM 2780/3780 communications is $628 on a 42-month lease including maintenance.

Four-Phase is based at 19333 Vallco Parkway, Cupertino, Calif. 95014.

Modular Computer Systems, Inc. (Modcomp) showed up at NCC with another member for its Modcomp IV family.

The Modcomp IV/35, a 32-bit mini, accommodates 1M byte of memory and 32 direct memory processor I/O channels; it was designed for stand-alone measurement, control and communications real-time tasks, the firm said.

Along with the IV/35 the firm introduced an enhanced version of its Max IV multiprogramming operating system, which it said allows double the virtual memory addressing available on the prior Modcomp IV models.

Eight virtual program environments are controlled by a memory management system which provides high-speed hardware for all memory allocation/deallocation and memory context switching functions, Modcomp said.

A basic Modcomp IV/35 with 32-bit parallel bus, arithmetic unit, 12K-byte memory and memory expansion capability to 1M byte costs $42,500. Modcomp is at 1650 W. McNab Road, Fort Lauderdale, Fla. 33309.

The Hewlett-Packard Co. (HP) 2108K is a microprogrammable processor on a board with 178 instructions.

The board has five times the performance of the Digital Equipment Corp. LSI-11 and was designed for word-processing and controller applications.

The board is available for $1,475 from the firm at 1501 Page Mill Road in Palo Alto, Calif. 94304.

Japan's Nippon Electric Co. Ltd. (NEC) showed its NEAC System 100 which, it said, will be available in the U.S. next year.

The small business system, with 32K bytes ot memory, keyboard and display console and disk, costs about $24,000.

The system festures Cobol, Fortran and Best, the firm's compiler language. NEC can be reached at 5 Militia Drive, Lexington, Mass. 02173.

Few Products Announced for Large Systems Users

(Continued from Page 1)

the CRT within 64 msec, according to an AT&T spokesman.

Beehive Medical Electronics, Inc., in Salt Lake City, Utah, introduced three terminal products including a remote video display terminal and an intelligent communications terminal.

The top-of-the-line Beehive B800 is said to offer the user full programmability with microprocessor storage capability of up to 32K 16-bit words.

It operates at transmission speeds up to 9,600 bit/sec in half- or full-duplex, asynchronous or synchronous modes. Communications interfaces available include RS-232C, asynchronous, synchronous or bisynchronous, Beehive said.

The B800's processor is a bipolar, 16-bit microprocessor operating in Data General Corp.'s Nova 1200-compatible code, it said.

The B800 carries a basic purchase price of $5,945.

Beehive also introduced the B500 and B100 communications terminals.

The B500 is also a microprocessor-based programmable terminal with 4K random-access memory (RAM) for the display and up to 4K programmable read-only memory (Prom), 8K of read-only memory (ROM) and up to 48K of RAM in the terminal program, the company said.

It features a down-load capability from the CPU, which is said to protect against memory loss; data transmission rates up to 19.2 kbit/sec; and full- or half-duplex on-line operation.

The B100 is designed as a self-contained remote video display terminal with switch-selectable transmission rates from 110- to 19.2 kbit/sec, Beehive said.

The terminal features cursor control, RS-232C or current loop interface and hard-copy capability with a printer interface. It employes a 12-in. CRT monitor which is formatted to display 12 lines or an optional 24 lines with 80 char./line; upper- and lower-case characters are optional, the company added.

The B500 is priced at $2,695 and the B100 remote display terminal costs $1,495.

Telenet Demonstrated

In one of the largest demonstrations to date of a packet-switched network, 16 firms were connected to the Telenet Communications Corp. network at the show. Academic, governmental and commercial time-sharing organizations provided terminal access to applications ranging from APL and economic forecasting to computer teleconferencing.

Attendees at the conference were able to use a variety of terminals to access 75 host CPUs that were operating at various DP centers around the country. In addition to the conventional CRTs, and other terminals, the New Jersey Institute of Technology showed an entry device which allows handicapped persons to enter data into a CPU using alternative methods such as touch and sound.

Interactive terminals provided by each organization in the demonstration were connected to a Telenet Access Controller (TAC) at the exhibition. The TAC was connected to the Telenet network which in turn provided interconnections to the individual participating networks.

Communications Offerings Sprinkled Liberally

(Continued from Page 1)

to its 350 data entry system to come up with the 351, an intelligent data entry system with 16K bytes of memory, 500,000 characters of diskette storage and either 60-, 120- or 180 char./sec printers, and a 300 line/min printer.

The 351-1 with a 60 char./sec printer rents for $400/mo on a one-year lease and sells for $16,100, while the unit with the 300 line/min printer rents for $715/mo on a one-year lease and sells for $26,800.

The Ann Arbor, Mich., firm expanded its 400 line with a Model 410, which is a single display station with 2.5M characters of fixed disk and a 60 char./sec printer for $516/mo on a three-year lease.

In other data entry action, Data 100 Corp. in Minneapolis, Minn., showed its Model 74-107 key-to-diskette version of its Keybatch data entry system.

The system can have one or two local keystations and up to three diskettes of 242K characters each plus a range of card readers and line printers and communications capability. The unit is priced at $370/mio on a five-year deal and carries a purchase price tag of $15,456.

Data 100 also added a 600 line/min printer with a removable character clip/cartridge. The 5560 with 132-column print line and 64-character Ascii font is priced at $8,900 on a purchase deal.

A plug-compatible replacement for the IBM 3741 key-to-diskette unit was announced by General Systems International in Anaheim, Calif. The GSI-741 uses biploar logic and comes with one entry keyboard, a CRT display and one or two flexible disk drives.

The unit has bisynchronous communications capability, and an optional hard-copy printer is available. The unit is offered primarily to OEMs at prices that are said to be 60% less than the equivalent IBM prices.

Motiograph, Inc. in Garland, Texas, made the first general showing of its Accurascan optical mark reader for the general-purpose computer user although the firm has been selling units to restaurants for over five years.

In the printer area, Potter Instruments Co., Inc. in Plainview, N.Y., introduced the LP7000 that is plug-compatible with the IBM 1403 and offers chain print speed from 1,240- to 1,500 line/min using a 48-character set and 132 columns. It is also available with 64-, 96- or 128-character sets, which are Ascii- or Ebcdic-coded, numeric, alphanumeric or symbolic and costs $21,855 and $31,340 with controller, the firm said.

The firm also exhibited a 500 line/min unit designated the LP6351 which is said to deliver 1,100 char./sec and has a reduced print size option. The unit, priced at $5,800, generated the standard 64-character font in a 9 by 7 matrix pattern and features a built-in microprocessor that uses special character set generation.

PL93-406 demands [illegible]

If yours is included you could [illegible]
a call to (817) 851-4111, in [illegible]

Why Brierwood Shoe Corporation could go to the same computer-leasing company as the U.S. Navy and be assured of good service.

When the U.S. Navy leases computers from a third party, they don't worry about getting good service when they need it.

But a single system user like Brierwood might have some doubts. Unless that third party lessor is DPF.

After all, with a 360-370 portfolio costing almost $300,000,000, we're one of the largest independent lessors in America and a very important customer of IBM.

Brierwood knew about our strong position in the leasing industry, our flexible terms, and our unbeatable price.

They came to us for a 360. And they liked doing business with us so much, they came right back to us for a 370.

We'd like to do business with you. If you're interested call our marketing VP, Anthony Pintauro, collect at (914) 428-5000. Or contact DPF at one of the addresses below.

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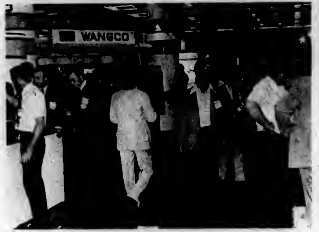
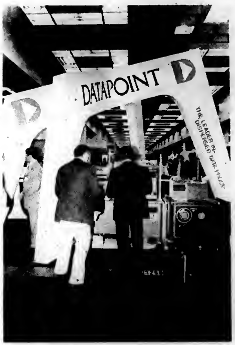


Shoe leather took a beating on the floor.

Tomorrow's experts were hard at work.

UNDER THE NCC BIG TOP

CW Photo Feature
By Ann Dooley
And Ron Frank



Under the Datapoint Arches

Birds-Eye View of CDC Booth

"Interpretation" of APL Characters

Explaining Computek Nitty Gritty

Univac told users about the 90/80.

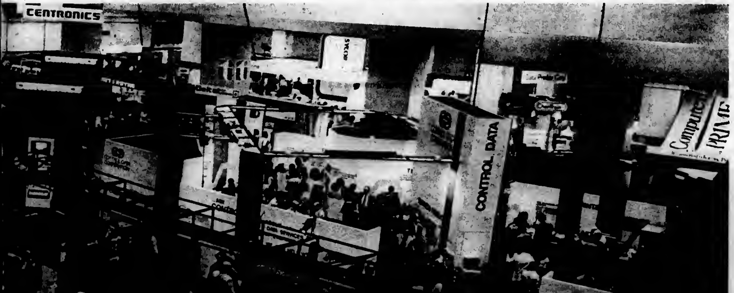
Some wheelers and dealers were outside.

Show business was back with a crack.

Show visitors got all the angles.

Prime patterns were prevalent.

Behind the Scenes at IBM Booth



Panorama by R. Frank, H. Fling, A. Dooley

Societies Chastised for Ignoring Responsibilities

(Continued from Page 1)

subject, Ralston proposed the technical expertise of Afips is not being brought to bear in U.S. vs. IBM.

The Afips president said he made no claim to understand the legal issues involved in the antitrust suit and its trial, but wondered whethef Judge David N. Edelstein, who is hearing the case without a jury, really has the technical information he needs to decide a case with such momentous implications.

Afips and its member societies put together a senior group of nonpartisan scientists and technologists to advise Edelstein on technical matters either by order of the court or as a friend of the court.

Friends and colleagues scoffed at his naivete, however, Relston added, suggesting that competent, nonpartisan comment is not possible in an adversary system like the law.

Nonetheless, by being subpoenaed to appear in court and testify on bahalf of one side or the other in a trial, computer scientists and practitioners lose any aura of objectivity, even though they may well be objective. Arguing that this hardly seems the best means of obtaining "the best evidence," Ralston proposed the establishment of a science court or board to advise judges in trials like U.S. vs. IBM and regulatory agencies like the Federal Communications Commission.

Unenforced Ethics

On the topic of professional ethics, the outgoing president noted the publication of codes of behavior by societies like the Data Processing Management Association (DPMA), the Association for Computing Machinery (ACM) and the British Computer Society, but added these are virtually unenforced in the U.S.

The publicetion of codes and the reading of them by many have promoted an understanding about the need for ethics and ethical behavior in the profession, he said. But Ralston is "strongly opposed to enforced codes of ethics," ha said.

Their anforcement is subjective, a matter of judgment by individuals, he said. In addition, the only sanction against unethical behavior at present is expulsion from the society whose codes have been violated.

Even if codes are enforced, they don't necessarily foster more ethical behavior by practitioners of a profession, he added, citing law and medicine as older professions with well-established codes and frequent violations nonetheless.

Watergate showed us lawyers are disbarred only after they have committed a crime, and current debates on malpractice revolve around insurance costs rather than how to prevent such suits from arising in the first place, Ralston said.

Broad education in the arts and sciences in addition to training in ona's craft is perhaps the best and the only way to teach ethics, he said.

Professional computing societies should take a firmer political stand on the need for a separation between politics and science, Ralston said.

"Certainly issues political, social or otherwise without a computing componant are just not fit fare for the comments of professional societies," he said.

At the same tima, he arguad societies hava a right and an obligation to comment on any issue that involves thair profession. In particular, scientific freedom — the ability of scientists to carry on the pursuits of their trade without government intervention — is a legitimate subject for professional societies to comment on, Ralston said.

While scientific freedom is not a particular problem in the U.S., he noted such freedom has been lacking abroad — notably in the USSR.

Next to food, however, technology is perhaps the most important commodity in the world today, he suggested. And as the aristocrats of science and technology, that gives computer practitioners and their professional societies enough leverage to be effective when countries like the USSR restrict the rights of a scientist to attend a scientific conference.

The Afips president urged American professional societias not to sponsor or participate in conferences held in countries where a commitment to scientific freadom has not been made.

Big Top Takes Over Big Apple for NCC

(Continued from Page 1)

Where tha printers didn't ring out, minicomputers, all types of disks and terminal equipment dominated.

While those products wera the most prolific, all segments of the industry were represented and exhibitors ranged from the largest of mainframers to the smallest of OEM start-up operations. All reflected the spirit of optimism that seems to be pervading the industry and appeared as happy as a six-year-old clutching a whirl of cotton candy and watching the clowns come out for the parade under the Big Top.

The generally well-attended technical program rounded out the show with what most agreed was the best set of sessions and papers in years. And even the long walks betwaen sessions and exhibit centers failed to deter most session attendees from getting their fill of technical details, nostalgia or social concerns.

The special sessions lived up to their names this year with the best student computer fair yet providing one of the highlights of the sideshows — a well-planned and interesting program rather than an afterthought, as it has been so often in the past. And the computer art exhibit was spiced with a silent auction and well-arranged showing.

The tents have been struck and the show has moved on, but the memories will linger until the Big Top rolls around once again next year in Dallas on June 13-16.

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DP Veterans Gather

Eniac 'Looked Logical' to Developers

By Molly Upton
Of the CW Staff

NEW YORK – There was a "psychological buildup]at the Moore School of Engineering] to the point where Eniac looked like a logical advance," John G. Brainerd, former supervisor of the Eniac project, recalled at an NCC session here last week.

"Origins of Eniac," attended by at least 10 veterans of the project, including four women, afforded insight into the behind-the-scenes chain of events which led to the contract award for the construction of the first election computer.

The group at Moore was "ready to at least consider far-out things," Brainerd said, noting there were several factors which, combined, were key to the birth of Eniac at Moore.

Had one of these factors been lacking, he added, the event might not have happened.

Joining Brainerd in his reminiscenses were Herman Goldstine, then the liaison officer with the Ballistics Research Laboratory, and Irven Travis, retired vice-president of research for Burroughs and formerly a professor at the Moore School.

By 1934, the analyzers were up and running.

In explaining the evolution of the Eniac project, Brainerd said it was important to note the group at Moore accumulated experience in obtaining and administering government contracts in an era when government contracts to universities were very rare.

Most universities had no experience administering the contracts, faculty had little or no experience in an R&D environment under contract conditions and some universities were opposed to government contracts, he said.

The Moore group had accumulated experience with large machines through its work on a differential analyzer and Brainerd's involvement with a network analyzer, he said.

Mauchly in Action

The idea of an electronic computer for ballistics control "got thrown around without much action" until John Mauchly appeared on the scene and wrote a memo which got the ball rolling, Brainerd said.

In order to perform the needed calculations for ballistics information, there were about 150 "human computers" who worked six days a week on a Ballistics Research Laboratory project conducted at Moore.

Most of these were women with mathematical backgrounds. But "we kept running out of women," Brainerd said, because they would move when their husbands were transferred, so Moore set up a training facility.

Approval of the Eniac project from the university took some arguing, Brainerd observed, but after only a week the provost was convinced the project should proceed.

In March 1943, Mauchly's proposal was shown to Goldstine, whom Brainerd described as having the ability to get what he wanted.

In April, accompanied by Mauchly and J. Presper Eckert, Brainerd went to discuss the project with the Ballistic Research Lab's Aberdeen group.

Approval was granted, largely because of Oswald Veblen, Goldstine said. The proposal was then circulated for comments.

All of the comments were negative, Brainerd added.

At the beginning of the project, the overriding concern was to make the machine function; programming took second place, Brainerd said.

Eniac was intended as a special-purpose machine to construct firing tables, but it was general-purpose by virtue of its capability to integrate differential equations and then inverse interpolate and other steps, he said.

CW At NCC

While the notion of flexibility was secondary at the beginning of the project, toward the end a group of the women "human computers" constituted the programming section.

All realized the Eniac would be a reality, and the software aspects loomed larger, Goldstine said.

As an example of what the programming group did, the first problem run on the Eniac was not for Aberdeen but for Los Alamos, he said.

With 15,000 vacuum tubes, Eniac was not given a larger mean time between failure by skeptics. In fact, some estimates indicated a problem would take 10 minutes to solve and the average mean time between failures would be 10 minutes.

However, after running the Los Alamos exercise, Eniac was up for "hours" at a time, according to members of the audience. The memory capacity was 20 accumulators or about 200 words, some veterans indicated.

After the war, Moore was asked to build a second Eniac. The request came from the Russian government, Brainerd said.

CW Photo by A. Dooley

Talking It Over

NCC attendeea compare notes in one of the few lounge areas on the convention floor.

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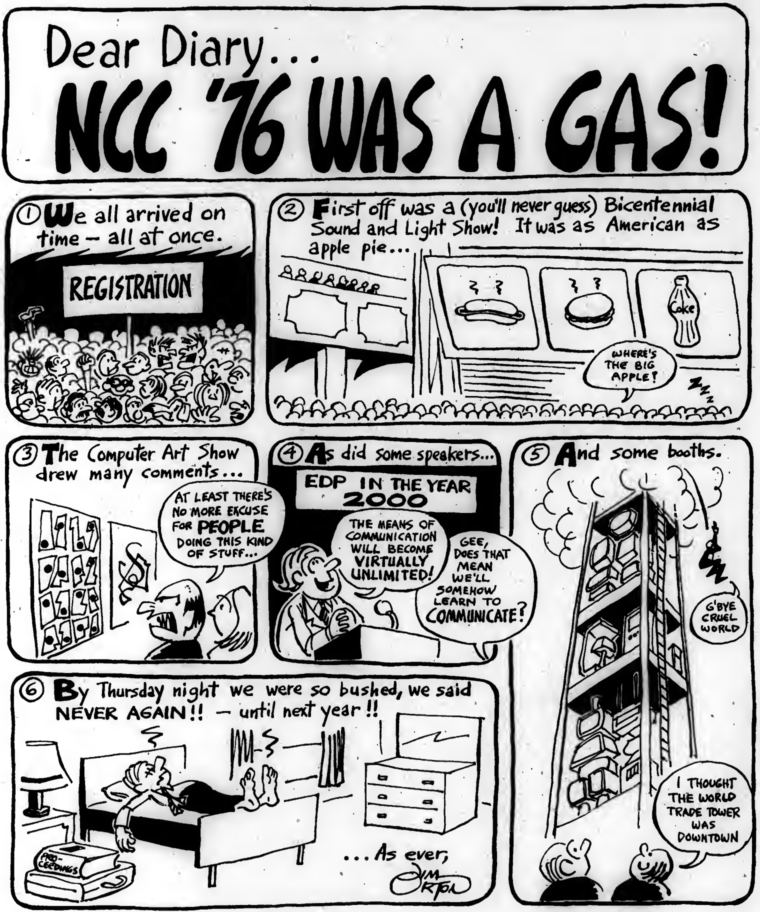
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② First off was a (you'll never guess) Bicentennial Sound and Light Show! It was as American as apple pie...
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③ The Computer Art Show drew many comments...
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⑤ And some booths.
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Fewer People Feeling Threatened by DP, Survey Finds

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Members of the general public feel slightly less threatened by computers today than they did five years ago, David Ahl, editor of *Creative Computing*, reported at NCC here last week.

A recent survey taken by that publication showed 37% of the adult respondents and 40% of those under 21 today feel computers dehumanize society by treating everyone as a number – a decline from the time five years ago when *Time* magazine asked the same question of the general public in a survey done in conjunction with the American Federation of Information Processing Societies (Afips).

At the same time, 87% of the adults and 84% of the youths surveyed feel computers are having a dramatic effect on the quality of life, Ahl reported..

Split Over Issues

But the two groups were split over the issues of whether computers will be used to improve the quality of law enforcement and health care. Of those surveyed, 82% of the adults said they feel computers would improve police work, while only 70% of those under 21 expressed the same feeling; 79% of the adults but only 54% of the youth category saw computers improving health care.

In addition, there appeared to be a greater awareness of the problems of data banks and privacy today compared with five years ago, Ahl noted. His survey showed 64% of both categories believe credit checks are a worthwhile use for computers.

The earlier *Time*/Afips study had showed a higher percentage who felt this a good practice, he said.

The two categories were also split over the question of whether it is possible to escape the influence of computers, Ahl reported, with the youth category feeling more often it is possible.

Overall, 92% of the adults agreed with the idea that a person cannot escape from the influence of computers, but only 67% of those under 21 agreed with that statement.

Young people appeared to be better acquainted with the more interesting uses of computers. Eight percent of the adults surveyed agreed computers are best suited for monotonous, repetitive tasks, while only 57% of the other group concurred with that statement.

Most people do view the computer as a tool, Ahl reported, noting 73% of the adults and 61% of the youths said the computer is just a tool like a hammer or lathe.

Surprisingly, however, one-fifth of those surveyed did not feel computers speed up business operations, but rather slow down and complicate simple business operations, he said.

CW
At NCC

There was disagreement between the two groups on whether computers will create as many jobs as they eliminate, with those under 21 far more skeptical than the other group.

While 63% of the adults agreed computers would create as many jobs as are lost, only 40% of the under-21 group agreed and a full 29% disagreed with the statement.

Computers are still held in awe by many in the general public, the survey showed, with 25% of the adults and 31% of the under-21 group agreeing with the statement that computers are beyond the understanding of the common person, Ahl said.

In all, 10% of both groups said computers make mistakes 10% of the time, Ahl reported, while 67% of the adults and 72% of those under 21 agreed with the statement that programmers and operators make mistakes while computers operate almost without error.

The adults were more positive about the possible technical solutions to the problems of privacy, the survey showed, with 60% of the adults agreeing it is possible to design a system which protects the privacy of data, compared with only 49% of the under-21 group agreeing with that statement.

Accessible DP Power Results Unknown

By a CW Staff Writer

NEW YORK – Computer power will soon be as freely accessible as electric power is today, but it is difficult to predict the possible consequences of that accessibility, Sema Marks, an IBM marketing representative, told a session on "Public Attitudes Toward Computers" at NCC here last week.

Access to systems is coming about rapidly, she said, noting some calculators now on the market have the power of an IBM 360/30.

All new technologies bring about problems; Plato worried that the use of writing might make it harder for people to remember, she pointed out.

While reading and writing were once very specialized skills handled by specialists, the printing press developed by Johann Gutenberg changed that, Marks observed.

At the time of that development, it was probably not possible to predict the effect it would have on the general public or how it would revolutionize the world, she noted.

Potential Accessibility Gap

Clearly there will be a growing demand for computer power, Marks said, since many school-age children are now being exposed to systems early in life and have come to view computers as a normal part of their worlds.

They will expect to have access to computers when they enter the business or academic world, she added, and this may lead to s gap between those with access to computer systems and those without access.

The early exposure students are getting to systems has also made them less willing to put up with problems in operating systems or other parts of the systems, she said.

In the future, therefore, systems will have to be developed that adapt to people rather than requiring people to sdapt to them, Marks said.

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Foreign Government Backing DP Firms

U.S. Control of DP Called Challenge to Europeans

By Edith Holmes
Of the CW Staff

NEW YORK – There is no question in foreign circles that the U.S. dominates the world computer market, according to an industry analyst speaking at an NCC session here last week.

At the same time, nations like Germany, France, Japan and England have viewed American control as a challenge, and their governments have met that challenge by vigorously supporting their home ventures into mainframes, the associate general counsel for Univac said.

Speaking at the annual conference's session on the world environment for data processing, David K. Anderson agreed with Fred Withington of Arthur D. Little that the U.S. unquestionably has the upper hand in foreign markets, but added that the national interests of these countries may lead them to turn the U.S. challenge around in the long run.

American Success

Withington spoke to the reasons for American success in the computer industry. Defining DP as "general-purpose computer systems primarily," he said. U.S.-based manufacturers won the market, not with their technology or their cost-effective offerings, but by providing users with a total package or range of machines with compatible capabilities and superior performance.

American computer makers have been particularly successful in what Withington identified as the dominant product of DP today – system programs. He suggested the perfection of multipurpose operating systems like IBM's OS and GE's Gcos over the last 20 years is a feat non-U.S. vendors haven't begun to match.

There is a trend among foreign companies to borrow U.S. technology and then expand on it – lately to build their own small machines and minicomputer networks, he said.

But "the name of the game is still general-purpose computer systems and will be for some years," Withington said.

U.S. manufacturers can leave many manufacturing costs behind and court subsidies from foreign governments by transferring all but their top management and research and development activities "offshore," he said. "Then all that's left in the U.S. is the head and neck of the chicken," Withington added, implying there are risks involved in maintaining the rest of the business abroad.

It is the national pride that keeps foreign countries from sitting back and letting "the four or seven crazy American firms in the computer business break ground for the industry in their countries," then taking their technology and revenues away from them and striking off in their own directions, he said.

Anderson argued it is that same "national interest," however, that is helping foreign countries to build their own computer industries in the face of American dominance.

Economic nationalism is on the rise in places like Japan and in Europe, even though much of the impetus for it has politics and prestige as its roots, he said. Computers have become symbols of economic and technical power.

Anderson noted nationalism has also pulled apart Europe's cooperative effort to establish a computer company. Formed in 1973 by CII in France, Siemens in Germany and Philips in England, Unidata was designed to pool the technologies of these companies and their countries and to create the economies of scale necessary to achieve success in the computer systems business, he said.

But by 1975, the unwillingness of Germany and France to give up the national independence of the companies they had involved in the venture led to its breakup. Siemens decided to go it alone with Unidata; France acquired a new partner in Honeywell Bull; and Philips withdrew from mainframe manufacture altogether, Anderson recalled.

Nonetheless, "the European computer community is healthy and has the potential for hurting the U.S. computer industry," he said, pointing out the support individual companies receive from their governments.

Technology Exchange Goal of Licensing

By a CW Staff Writer

NEW YORK – Ultimately, technology is exchanged through international licensing, Maurice A. Longsworth of Honeywell Information Systems told an NCC audience discussing the world environment for data processing here last week.

If those companies that have technology give it to foreign firms, they will effectively provide the less developed companies with the research and development resources they need. In the long run, Longsworth said, the less developed firms will return this aid in the form of their own innovations.

He sees an increasing emphasis on technology transfer between companies and nations in the years ahead.

There is an increased demand for technology in countries that have natural resources to exchange, Longsworth said. Coupled with world economic interdependence and balance of trade problems, the transfer of and licensing of intellectual property is a growing business, he said.

Add to this environment the presence of multinational corporations with their desire to carry products throughout the world, the nationalism of countries and their concern for strategic advantages, and a growing interest in joint ventures becomes a reasonable compromise, Longsworth suggested.

Joint Ventures Prevalent

Licensing was more popular in the past than it is now, he said. Joint ventures have become more prevalent because companies with technology want the continued commitment of foreign firms, and

(Continued on Page 13)

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Eastern Bloc CPU Found Twice as Powerful as 370/145

By Toni Wiseman
Of the CW Staff

NEW YORK – The Eastern European-built Ryad ES-1040 processor is about twice as powerful as the IBM 370/145 in scientific and engineering applications and at least equivalent to the 370/145 in business applications, Robert A. Koenig told NCC attendees at a session here on computing in Europe.

Koenig is a principal consultant of systems strategy for Control Data Corp. In 1975 CDC purchased an ES-1040 for testing and evaluation.

Basic findings were that the ES-1040 is compatible with the IBM 360 instruction set, he said. The processor technology, using TTL integrated circuits, lags the U.S. by three years, the core memory shows a lag of about eight years, while peripherals are eight to 10 years behind the U.S., he said.

The Ryad family consists of six processors, numbered from 1010 to 1060, and a complement of peripheral equipment developed by Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland and the USSR.

The system CDC purchased consisted of the CPU, an operator console, a main memory of 256K bytes, a byte multiplexer channel and one selector channel, Koenig said.

The peripherals included a card reader, card punch, line printer, two 7.25M-byte disk drives and two 79 in./sec tape drives.

To test the Ryad system's compatibility with the IBM 360 instruction set, CDC ran a set of jobs from the Service Bureau Co. (SBC), he said. The SBC personnel brought their operating system, recorded on a 2316 disk pack; customer programs; and customer data.

"The SBC software, normally run on an IBM 360, was loaded into the ES-1040 via an initial program load (IPL) and the customer programs were successfully executed," Koenig said.

CDC concentrated most of its evaluation on the performance of the CPU, since I/O-bound jobs would have been highly affected by the restrictions of a single selector channel as well as by the peripheral configuration, he said.

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A Gibson mix analysis, which evaluates CPU performance primarily in a scientific and engineering environment, revealed the ES-1040 was about twice as fast as the IBM 370/145, two-thirds the speed of the IBM 370/155 and about half the speed of a CDC Cyber 73, he said.

CDC also wrote some Fortran programs designed to test the speed of the 1040 vs. the IBM 370/145.

"The pure floating-point arithmetic tests showed the ES-1040 is three to four times faster than the 370/145," Koenig said.

"On the other hand, a Fortran program stressing memory speed and using only integer arithmetic showed the 370/145 ran that program at twice the speed of the 1040," he added.

Koenig said CDC had not been nearly as successful in running business applications, primarily because of the lack of a Cobol compiler and because they had only a single channel to service both tape and disk.

When the ES-1040 was purchased, CDC also acquired a set of operating software known as DOS/ES, he said, which bears a striking resemblance to IBM DOS. The product set under DOS/ES included a Fortran IV compiler, an assembler, RPG and PL/1.

"In addition to DOS/ES, a more advanced system called OS/ES is also offered," Koenig said. "From the information offered, it appears to be very similar to IBM OS, offering MFT and MVT options."

He added that to his knowledge no ES-1040 systems were using OS/ES, probably because of the lack of adequate mass storage.

No single comparison can be applied across the board to the ES-1040, Koenig said. The CPU stands out as the most advanced element of the system.

Technology Transfer Licensing's Goal

(Continued from Page 12)

those that have little technology also tend to have little marketing know-how and can use that expertise as well.

While there are advantages to both, striking a deal is difficult, he added. The licensee wants the latest technology, but the licensor, usually in the U.S., is faced with export control regulations.

The licensee prefers a joint venture, while the licensor would be just as happy with a straight licensing arrangement, he said. Payment through output, selling in the West and dealing through a barter system all appeal to the less developed company and its country, while hard currency, additional markets of its own and dollars are the wants of the company doing the licensing in the U.S.

Intellectual property – technology in patented and copyrighted material – is valuable, but at what price? Longsworth asked. A company may have poured $10 million into research and development for a technology for which it will get only $500,000 from its licensee.

Licensing can never be an end in itself; it must fit in with the corporate goals of the licensor, Longsworth added. It is important, too, to remember the licensee is a potential competitor.

But the flow back of technology and the establishment of joint efforts are important and can result in a share back of resources.

A licensee must be managed carefully, Longsworth cautioned. The licensor must avoid the "tail wagging the dog problem" where, for example, a licensee demands and gets a modification of the licensor's product line to meet his particular needs.

The licensing process itself can control the transfer of intellectual property and technology, Longsworth said, particularly if it is in the form of a joint venture.

In looking for a company to license, he suggested the licensor consider the candidate company's skilled labor, its management ability, its marketing capability, the political stability of the country it is in, the attitude of the firm and its country toward licensing and the volume of business it is likely to do.

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Datagram vs. Virtual Circuit Hot Topic, But Panelists Agree Standards Desirable

By Ronald A. Frank
Of the CW Staff

NEW YORK – Despite claims that universal protocols are desirable, two major approaches are developing in international communications networks, panelists at an NCC session on computer networks said here last week.

And the results of current communications standards efforts may favor IBM, according to Louis Pouzin of the Iria network research institute in France.

The two major approaches are the virtual circuit and the datagram interface protocols; several versions of the former are now being implemented, Anthony Rybcznski of Bell Canada said.

The virtual circuit is exemplified by the CCITT X-25 protocol which is operating in an experimental mode on an IBM 3705 for initial use later this year on the Canadian Datapac network, he noted.

The X-25 protocol is also compatible with the Telenet packet-switched network operating in the U.S., Barry Wessler of Telenet Communications Corp. observed.

But it is too early to evaluate the relative efficiencies of datagrams vs. virtual circuits, Pouzin said, because there have been no real implementations of either approach on a widespread basis.

Little market need has been seen thus far for datagrams, while virtual circuits have more appeal to users, Rybcznski said.

Pouzin disagreed with this, however. Datagrams have an "identified market," he said, but arm-twisting is taking place to turn potential users toward the virtual circuit protocol.

When network users are interested in a "transport facility" to move their data, datagrams appear to have an edge over virtual circuits, Pouzin said.

When a network becomes a terminal handler, adaptations are more complex and require character stream interfaces; intelligent terminals would make this problem disappear because they can use a datagram interface, he explained.

Carriers Nixing Datagrams

Although various groups are calling for a datagram interface, the carriers are opposed to it. Four carriers are "rushing a virtual circuit protocol through CCITT," Pouzin charged.

These carriers want to take over terminal handling and, eventually, other processing functions as well; datagrams would leave too much freedom to the customer, he said.

"The political implications of the carrier policy suggest that better boundaries be drawn up between carriers and data processing," he remarked.

The political significance of the controversy between datagrams and virtual circuits signals a power struggle between carriers and the computer industry. "Everyone knows that in the end it means IBM vs. telecommunications," he said.

It may be tempting for some governments to let their carriers monopolize the DP market as a way to control IBM. "What may happen is that they fail in checking IBM, but succeed in destroying smaller industries," Pouzin warned.

Wessler, supporting the use of the virtual circuit approach, said it is to the advantage of users, vendors and carriers that standards continue as they are presently going.

"The benefits to accrue are simplified design and use of equipment, lower cost, higher transmission efficiency, interconnectivity and enhanced performance," he said.

The X-25 interface recommendation has been implemented in Telenet, the Canadian Datapac and the experimental French RCP network. The protocol has also been specified for use on the French postal and telegraph authority's Transpac and the Euronet international network being developed by a number of European telecommunications administrations, he said.

CW Photo by A. Dooley

Checking Out

NCC attendees could get their groceries on the floor of the convention center – but only if they were lucky enough to watch a demonstration of IBM's supermarket scanning system for items marked with the Universal Product Code.

Research in Parallel Processing Questioned as 'Waste of Time'

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Business DP users may not yet be seeing the results, but there is a great deal of work going on in parallel processing around the world, an NCC panel session here last week revealed.

At the same time, however, the session also showed there may be some dissension among the academicians and other researchers over the value of such research into high-speed computer systems.

The major reason for turning to parallel systems, according to Liba Svobodova of MIT, the session chairwoman, is to enable designers to build faster systems because present technology cannot increase the speed of processing past certain points governed by the law of nature.

And the panelists – including H. Sechovsky from the Research Institute for Mathematical Machines in Prague, Czechoslovakia, and J.P. Agrawal of the Indian Institute of Technology in Madras, India (whose paper was read since he was unable to attend) – seemed to agree faster processing speeds were the main reasons for parallel systems.

In addition to the possible faster processing speeds with parallel systems, Sechovsky suggested, higher reliability and fault-tolerant computing could be the end result of research into parallel processing.

He also said better integration between the hardware and software components of a system should be possible with the use of parallel computer systems currently under development, since LSI technology allows a designer to build some functions commonly viewed today as software into the hardware.

But Dr. Clarence Ellis of MIT took a different tack and suggested some of the work in parallel systems might actually be a "waste of time."

Previously we lived in the "romantic era," when systems were designed to be bigger and faster; it was thought a system could be designed to solve all of our problems with computing, Ellis said.

The IBM 360 line and later systems such as the Illiac IV were attempts to move in this direction, he said, as were programming systems that promised to be all things to all people.

But those machines often turned out to be large and clumsy, and several of the large parallel processor designs since then have failed, he noted.

"Now we are moving into the modern era," he said.

The problems no longer center on machine speed, he said, but rather concern the simplicity and structure of systems.

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Systems Vendors Blamed

DOD Reports Security Still a Problem

By Nancy French

Of the CW Staff

NEW YORK – Security is still a problem in the Department of Defense (DOD), but not in the way columnist Jack Anderson would have one believe, a panel of security experts said at NCC here last week.

And the problem is being exaggerated in networking and systems shared by both classified and nonclassified users, according to Eugene V. Epperly of the Office of the Deputy Assistant Secretary of Defense for Security Policy.

James P. Anderson, an independent computer security consultant, blamed computer manufacturers for the lack of progress.

"As a group they don't see a significant market for secure systems outside the Department of Defense," and "they are not willing to commit themselves to costly R&D efforts without DOD sponsorship," he said.

Although a DOD security task force hammered out security policy in 1970 and published a manual two years later, "no manufacturer has a fully certified secure operating system even today," Anderson said.

A look at security projects under way reveals "it's a Digital Equipment Corp. festival," he said. "Nothing has been implemented on the Burroughs Corp. B1700, Control Data Corp. or NCR units or, with apologies to 'Multicians,' Honeywell systems either, Anderson told attendees.

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Furthermore, "we still have no definition of a secure network," he said.

Other panelists – from DOD – offered descriptions of what Anderson referred to as "interim measures."

Since the number one security axiom is "100% security is impossible to obtain in the real world" because of costs or other constraints, DOD agencies attempt to be "relatively secure," according to Epperly. They do this by employing security barriers in "complimentary combination" to achieve defense in depth, he said. The objective is to make the cost and risk of penetration exceed the value of the payoff, he said.

However, there is a basic conflict between good security measures and users' operational requirements that put more and more computer terminals in remote locations, according to William Leary, who works with DOD's Office of Telecommunications Command and Control Systems (TCCS).

Security measures at the high end of the spectrum are aimed at deterring or detecting the intruder, "or some graceful degredation" of that goal if the maximum is not attainable, he said. The objective is to avoid data being stolen or manipulated or a situation where service is denied by a carefully engineered system crash, Leary said.

TCCS has had a general-purpose message-switching system in operation since the 1960s that offers an example of security measures in use today.

In it terminals are physically protected, and all personnel with access to them are cleared to the highest level of data that is entered there.

Second, the circuits are link-encrypted; and, third, switchers are isolated, with personnel at these sites cleared to the highest level of information that passes over the network.

Data is sent in asynchronous blocks in a half-duplex way, he said, and the system has no ability to generate code in the switchers, he said.

The Air Force's Advanced Research Projects Agency (Arpa), too, has several security projects of its own under way "although we still have not solved the general-purpose computer security problem," Steve Walker, an Arpa spokesman, said.

Arpa is using the security kernel approach, whereby security code is isolated into as small a module as possible to assure "it doesn't do anything more than what it's supposed to do," he said.

Hardware insures that other software can't be used to modify the security kernel, he indicated.

Among Arpa's ongoing security projects are kernelizing the control program of IBM's VM 370 system, a DEC PDP-11 security monitor and a message system, he said.

Arpa is also working on an end-to-end encryption demonstration in which data is encrypted before it is transmitted on the network and translated back after it is received at the other end, he said.

Ongoing security activity is combining the National Security Agency's security expertise and Arpa's network protocol expertise, he said.

CW Photos by A. Dooley

Step Right Up

Datum was dealing deliberate details for determined NCC devotees.

Word Processing Seen Merging With Data Processing in Future

By Catherine Arnst

Of the CW Staff

NEW YORK – The convergence of word processing and data processing is definitely part of the future, according to Robert LaDue of IBM's Office Products Division.

And "it's a pretty safe bet the systems that will result will be cost-justified," he told an NCC session here last week.

"People ask, 'How did the office drop out of the mainstream of progress?' The answer is that the office was never in the mainstream of progress in the first place," he said.

But word processing should put the office into that mainstream, he indicated. "Five years ago, word processing got blank looks"; now there are all kinds of reactions to it, both good and bad, he said.

Word processing should significantly change the behavior of an office, possibly even to the point of creating a paperless office, he predicted.

This would be a switch from today's office environment – there are now more white-collar than blue-collar workers, and "their job is to sift through ever-increasing paper," he said.

Most word-processing systems are currently geared to making the secretary more effective, he said, adding there has been a failure to provide the same service for management.

Energy has been misplaced in this case, LaDue said, because management's time is far more valuable in terms of cost.

The time spent by a manager to write a letter will be the most expensive components of that letter by 1985 since nothing has been done to automate his job function; all attention has been focused on the secretary or office clerk, LaDue said.

A word-processing system must, however, be able to accommodate the human element which will work with it. "There must be a growing concern for the human capacity for change" and that change should be evolutionary rather than revolutionary, he warned.

Two years ago IBM began research into the nature of work to determine how word-processing systems can fit into an already existing office. It discovered there are two basic types of offices: the custom office environment, where the duties of employees constantly change, and the production office, which has routine functions performed consistently by the same person.

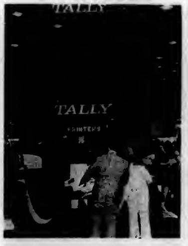
"One system will not work for both types of office" and one of the worst mistakes that could be made is to try and design one that does, LaDue said.

"The key to success of word-processing systems design is understanding the nature of the work environment. Don't let [the system] be too sacred in design," he added.

LaDue emphasized that the system that is designed should not be aimed just toward increasing the productivity of the secretary; the manager should have the same productivity aid.

And, when designing word-processing systems, it should be kept in mind that "this is not a technical universe, but a personal one," and the system should be designed for people, LaDue said.

The potential for word-processing systems linked to data processing is great; it only needs a systems approach and a commitment of resources from manufacturers, he concluded.



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Quality, Not Method, Key to Structured Design

By Don Leavitt
Of the CW Staff

NEW YORK – Top-down vs. bottom-up implementation of a program or system disappears as an issue if the design work is good and the user doesn't try to solve several significant problems at the same time, according to consultant Larry Constantine.

As one of the panelists at a heavily attended NCC session on structured design, Constantine said a well thoughtout design and "a structure chart of some kind" can provide the insight "top-down" programming was intended to discover.

CW At NCC

Although they disagreed sometimes on specifics such as the definition of a module and generally on whether data flow or data transformation should be the critical factor in identifying the boundaries of modules, the panelists tended to agree orderly preparation before any coding is started is more important than whether "rules" of structured programming are always followed.

A well thought-out design is far more important than either top-down or bottom-up implementation, according to Glen Myers of IBM's System Research Institute. As long as the programmer works piece by piece, integration and testing is relatively easy and "certainly better than the big bang approach" that characterizes the testing of monolithic systems, he said.

In some evaluations, programs written in the traditional bottom-up way have been judged better than top-down efforts, Myers noted.

In his introductory remarks, session chairman Ed Yourdon of Yourdon, Inc. explained structured design is the art – "Or is it a science?" – of deciding which components, interconnected in which way, will best accomplish the goals of the project.

In support of that definition, Yourdon said five elements have been identified as part of structured design: documentation, theory, heuristics, strategies and implementation efforts.

Documentation ranges from IBM's Hipo charts through data flow diagrams, and the choice in any given project is pretty much a personal one, he indicated.

Theory is perhaps the strongest aspect of structured design, he went on – it gives an order and purpose to the whole subject. The terminology's meaning is sometimes debated, but coupling and cohesion of data are part of the scene and so is information hiding and structure clashes, he said.

Heuristics, or rules of thumb, abound and include debates about module size, span of control, scope of control and scope of effort, he added, while strategies take one into the range of transaction-centered vs. transformed-centered design, backtracking and program inversions.

In his formal presentation, Myers described what he called the source/transform/sink decomposition approach to determing what is really involved in a user request for DP support.

In outlining the problem structure, Myers warned it is vital to recognize this is not the program structure. The analyst must determine what the ultimate end user wants to achieve, not how the programmer will achieve that goal, he said.

Once the problem is broken into parts related to data transformation activities, the analyst identifies the major input and output data streams, then pinpoints where these streams start and end within the problem structure, Myers said.

That breakdown should therefore identify the input, processing and output portions of the problems, and detailed design on each of them should provide similar subdivisions within each of those subsystems, he said.

Static and dynamic verifications can then be applied to make sure the modules being defined are coherent and comprehensible, he added.

CW Photo by A. Dooley

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Software Dilemma Seen: Share or Reinvent the Wheel?

By Don Leavitt
Of the CW Staff

NEW YORK – There is a growing reluctance on the part of installations to share software with others even while there is also an awareness that such reluctance causes pointless, expensive "reinvention of the wheel," panelists at an NCC sessiona here last week agreed.

This strange situation occurs, session leader Margaret Butler of Argonne National Laboratories said, because sites have become extremely proprietary of their own efforts.

This harks back, in all probability, to IBM's unbundling and the awareness that software "really does have a value," she said.

There are small instances in which sharing is still almost a way of life, but as an example of the current trend she noted the library built up over the years by the Univac Systems Exchange "seems to be weakening lately."

The Argonne Code Center, which Butler directs, was organized in 1960 as the central point for distribution of all code used by the U.S. Atomic Energy Commission labs and contractors for reactor problems. In 1972, it was designated an agencywide software exchange and information center supporting a wider spectrum of problem areas including commercially available software.

GSA Exchange

Last February, the *Federal Register* announced the formation of a Federal Software Exchange under the General Services Administration (GSA) "for interagency sharing of common-use software," Butler told the session.

Unfortunately, she added, it still isn't clear how this operation will affect such ongoing efforts as the Argonne Code Center.

The GSA exchange may very well detract from the work of current specialized interchange efforts rather than enhance them, she said.

Outside the strictly government arena, Butler spoke highly of the efforts of such publications as the *ICP Software Directory* and its "Million Dollar Club" as a means of bringing users and developers of software together.

No Guarantees Possible

On a more esoteric level, Dieter Fuss, director of the computerized thermonuclear research network based at Lawrence Livermore Laboratory, outlined how that effort has provided a real sharing of software – and computing power – among four sites.

More sites are expected to be linked into the net by the end of fiscal year 1976, but the buildup of the program library through acquisition of software from commercial sources has run into problems, he admitted.

The problem basically is that vendors want protection and assurances their software won't be disclosed to unauthorized people, Fuss explained, "but with our interactive mode of operation, we just can't give that kind of guarantee."

The solution would seem to be to find mutually acceptable conditions within the contract language, to pay to ease the restrictions or to write the software inhouse, he said.

The first two options are generally quite difficult to work out, "so we build an awful lot of our own code," he concluded.

Different Sort of Problem

Walter B. McRae has a rather different problem. He is the director of the Computer Software Management and Information Center (Cosmic), sponsored by the National Aeronautics and Space Administration (Nasa), which was started nearly 10 years ago as a means of making available to any domestic users the software routines developed by Nasa and its contractors in conjunction with the space programs.

This software has been paid for by the original using agencies, so the programs are available essentially for the cost of distribution. There are about 1,500 programs in the Cosmic library now, the majority in engineering and mathematical areas, and they were all put through acceptance tests before Nasa would allow their use.

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But McRae has found there is no "good mechanism" for letting the public know about the availability of these programs; there is incompatibility across hardware vendor lines even in compilers of "standardized" languages; and there is no "generally accepted" vehicle for transferring the program logic from Cosmic to the user site – "except the 80-column card, and there are some problems even there."

The problems of attempting to share software is "exacerbated by the incredible growth of minis, micros and programmable calculators," he added.

Prof. Stanley Hagstrom of Indiana University was more optimistic in general than the others. He runs the Quantum Chemistry Program Exchange (QCPE), which started in 1962 when a number of researchers saw a value in letting others know of routines they had developed but didn't want to bother publishing in computer-oriented journals, where they would be subjected to refereeing.

The result is a library of routines – almost all in Fortran – ranging in size from 100 to 30,000 statements – each of which is available to QCPE members for $20 "plus postage and any documentation we might put together."

Hagstrom and his staff make no effort to check the programs submitted to the exchange, but he strongly supports active feedback to the developers when users have comments, suggestions or complaints.

It is "probably essential" an exchange such as this is based at a large university, he said, since "considerable technical expertise is right at our fingers in case of a problem."

Program Transfers 'Inevitable as Death, Taxes'

By a CW Staff Writer

NEW YORK – Conversion or transfer of application programs and files or data bases from one computing environment to another "is as inevitable as death and taxes," Prof. Alan G. Merten of the University of Michigan said in introducing an NCC session here last week on transferability problems.

In fact, Merten emphasized, there are three components to most conversions: the application programs, the data and the job control statements.

Each has its own unique problems, he said, noting JCL is often the only thing a user has to work on in moving from IBM's DOS to OS – "but that's enough."

Conversions are problems today because no one recognized until recently that the conversion effort causes some of its own peculiar problems. In the old days, the hardware manufacturers generally considered conversion "strictly the user's responsibility," Merten said.

The conversion of existing programs got all mixed up with the integration of new programs and data into the new environment; the costs were hidden and, because there was no generally acceptable approach to the problem, there was the classic reinvention of the wheel in every shop, he said.

It is only recently that conversion has been recognized as a separate problem for the DP community. With that recognition, a whole evolution has been set in motion, Merten said, adding the hardware manufacturers are providing help to a much greater extent than evar before.

Beyond that, he said, users have recognized the cost and the complexity of the effort, quite apart from any new development work going forward for the new equipment.

Concern about the cost of converting data, even if the programs can be brought over "as is," has been heightened for those users who have data base management systems rather than mere files, the professor noted.

Seven Changes Identified

Robert A. Marion of the Defense Communications Agency (DCA) noted the Department of Defense recognized its own need for "some kind of automated tool" to help with the conversions in which it becomes involved.

The changes are frequent and usually difficult because they entail mutiple changes at one time, he said.

Looking at the problem, especially in relation to data base systems, Marion said his staff identified seven different combinations of possible changes in operating system, data manipulation language and data structures. The simplest of these entails a change in only one of these areas; the next "layer" involves two changes, while the seventh possibility is a change in everything.

Although individual conversion programs could be created to handle each of these situations, he said DCA thought "it would be good" if it could have one package to handle all seven combinations, with different parameter cards shaping the processing required on any given run.

As the agency looked at the problem more closely, however, it saw the need for a "bridge" rather than just a data translation effort, Marion said. Then, mixing his analogies, he drew a pyramid to illustrate the things that had to be addressed by this visionary product.

There were five layers in Marion's pyramid, with data description language at the bottom followed by the data base, the data manipulation language, application software and, finally, operating system software.

Thus far, he said, DCA has gotten well into its work on data base and tentatively into parts of the manipulation language and the applications area.

Dr. Elmer Bartels, manager of software development for Honeywell, Inc. in Billerica, Mass., was equally pessimistic: the best way to handle a conversion is to avoid it, he said.

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2000 Envisioned Without Newspapers, Commuters

By Nancy French
of the CW Staff

NEW YORK – In just 24 years computers and telecommunications will have eliminated newspapers as well as the daily commute to work, but computers that work with natural language and unstructured information retrieval systems still will not be a reality, a panel of "futurists" predicted here last week.

At an NCC session on "Information Processing in the Year 2000," Walter L. Anderson of the U.S. General Accounting Office predicted computing will become the largest U.S. industry by 2000 A.D., with 90% of the nation's workers dependent on computers for their livelihoods.

In that year managers will have "computerized office assistants" that can be taught like a secretary with an IQ of 60, but this assistant "will never forget a function once taught," according to Fred G. Withington of Arthur D. Little, Inc.

While there will still be "no crashproof systems" in the computer rooms, there will be reasonably "foolproof systems," but "no damn foolproof systems," he jested.

Circuits will cost 15 to 20 times less than they do today, but as early as 1985 "we will have learned we can't continue to pour bushels of circuits on a problem – we'll have to start thinking," he said.

In the postindustrial society the panel envisioned, the nation's 262 million people will be divided into self-sufficient communities of a size compatible with the resources they depend on, according to Margaret Butler of Argonne National Laboratory.

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The typical home will be equipped with a video computer communicationa console consisting of the basic video telephone and microprocessor, with optional light pen and graphics capability, an alphanumeric keyboard, video recorder and camera, facsimile transmitter and extended computer capability, she said.

For $500 the average family will be able to install a transceiver on its roof and, by sending up a password, receive anything from college courses to the latest pornographic movies, according to Withington.

The workday will be considerably different from that of today because most white-collar workers will work at home, using their communications facilities to conference with fellow workers who will also be at home, Butler said.

Automated shopping services, consumer advisory service, emergency medical counseling and utility meter reading will all be available via the console, she said.

Education will be enhanced by TV class instructions and electronic access to libraries, she said, and weather forecasts, an events calendar, open meetings of governmental units, electronic mail and a ticket reservations system will also be available.

Health care ranging from patient interviewing and history taking to diagnosis and prescription review will be available via the CVV.

In the government sector, computers will be used for everything from estimating crop production to automated traffic control and TV surveillance combined with computerized crime detection.

Life Still Not Perfect

Despite the advances the panel predicted, computers will not have solved all problems by the year 2000, according to Murray Turoff.

Long-term planning still will not be considered a serious endeavor since computer modelers will not have a model complete enough to predict the annual agricultural cycle, he said.

Turoff, who is with the New Jersey Institute of Technology, predicted hard-copy newspapers will not even be missed by the year 2000 since even the *New York Times* will have been computerized since 1993.

"By the year 2000 the only hard-copy newspaper left will be the *Ludite Worker*," Murray joked.

And, also by the year 2000, the average home will have been spending as much on computers as it does on automobiles for 12 years, he said. "By then everyone will have realized why IBM took over *Good Housekeeping Magazine* back in 1977," he quipped.

Text-processing systema will be so sophisticated "we'll be able to dial emotional content into our writing," he said.

Descriptive and Prescriptive

Because of passage of federal data property rights by 1980s, people will have to pay a service charge to be included in a data bank. Without it, the individual will not be able to obtain any services, Turoff said.

Descriptive data bases will have become so prescriptive that, after collecting information about doctors, insurance companies will set malpractice rates on an individual basis, he said. As a result, doctors will shy away from high-risk cases, making it necessary for the government to set up special treatment for them.

The biggest bureaucracy of the day will be the Jobs Allocation and Welfare Service (Jaws), he predicted.

Jaws' official function will be to monitor and tax production using that tax money to create jobs. However, its secret mission will be to introduce errors into transaction systems, making it necessary for companies to hire more people to isolate and correct those errors, he said.

One attendee, questioned the overall wisdom of increasing people's interaction with machines and decreasing their association with people.

In reply, Withington said he hoped machines in the year 2000 would be graceful enough to help people communicate rather than isolate them still further.

Others suggested the trend toward working at home would finally liberate a person from choosing a home convenient to work rather than near his recreational and emotional interests.

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But Some Must Settle for Less

Planning for Long Range Best Approach, Users Advised

By Esther Surden
Of the CW Staff

NEW YORK – "Those users who need to get away from the crocodiles must focus on shorter term planning before going to long-range planning," according to Ephraim R. McLean, associate professor at the Graduate School of Management of the University of California at Los Angeles.

Speaking before a large audience at an NCC session on "Long-Range Planning for Computer Usage in Large Organizations," McLean said long-range planning is definitely more advantageous for a company as a whole, but those companies which are poorly organized or underdeveloped may not be ready for it.

McLean focused on a type of management planning he termed "strategic" – planning which deals with managerial concerns – as opposed to shorter term planning, which is focused on operations. He defined a management information system (MIS) as that cluster of activities which surrounds the computer and its personnel.

"It is no longer feasible to have systems for their own sake," he said.

Jobs for Planners

The first task for long-range planners is to define the character of the information services organization, McLean said. Once that job is done, the next task is to assess the MIS environment and consider the risks and opportunities in projects to be undertaken.

Planners should next set MIS objectives and develop broad courses of action to achieve those objectives. After this, policies must be determined, he said.

Policies are guidelines to be used in carrying out strategies, McLean said, and include such concrete plans as whether to use steering committees and what procedures should be used when dealing with vendors.

McLean identified three types of planning that can take place within an organization. Strategic planning does not deal with specific projects, but with types of user needs that will emerge in the future. This focuses on what will happen in a five- to seven-year range, he explained.

The second type of planning designed to meet the needs of the host organization is in the two- to four-year range; the third, short-range planning, deals with the creation of timetables and performance target dates.

"Many organizations falter when it comes to planning because they try to carry out all types simultaneously," McLean said. The correct order, he advised, should be long-range first, medium next and short range last.

Most organizations are not developed well enough so they fall into the medium-range planning area, he noted, suggesting these organizations create a "hopper of opportunity" to identify potential projects the MIS department could undertake.

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The projects should then be evaluated, ranked by priority and finally translated into action via plans.

Ways to identify opportunities that can be approached are varied, McLean said.

The isolated approach, identified as waiting until new legal requirements force the firm to revise an application or until obsolete equipment makes it worthwhile to retrofit a system, is one method of setting goals for MIS; another is to emulate other successful companies and the projects they have developed for their systems, McLean said.

The "bottom-up" approach could be used to find out what the system users need or want and then develop the means to implement these applications; the "reactive approach" responds to requests made by high officers of the company for needs they see, he said.

A "derived top-down" approach can be used when there are no standard MIS corporate policies; the MIS department must hypothesize what the policies would be and try to develop projects to fulfill these hypothetical goals, McLean said.

A true top-down way of handling the MIS would be to incorporate all projects undertaken by the department as part of a general business plan. An interactive approach could integrate MIS with the planning activities of management throughout a company, he said.

After the "hopper" is full of all the projects that need to be undertaken, a problem remains as to which projects should be acted upon. A summary evaluation without a detailed feasibility study can help to rank all the varied projects, he added.

After this step is taken, the establishment of a steering committee can be helpful, McLean said. "Many steering committees have been ineffectual," he warned, because they have been unable to resolve competing demands for limited MIS resources.

For a steering committee to be useful, it must have clear-cut guidelines to translate projects into action plans, he said.

One concept the MIS managers should remember, McLean said, is that "planning processes and decision-making processes are dynamic, not static," and the managers must measure progress against results.

Plans and strategy should be flexible and able to be changed if they need to be, he said.

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Understanding Business Vital

Sound Design Requires Knowledge of Who Must Use MIS

By Esther Surden
Of the CW Staff

NEW YORK – The key question in designing a management information system (MIS) is "Who are you designing the system for?" according to P. Duane Walker, senior vice-president of Humana, Inc., a hospital management company.

Information systems should be designed for the general manager, the person who sits at the top of a major division and whose primary mission is planning and control. Usually this person has a staff which helps him do planning and deep control of business and which also uses the information systems staff, Walker said at a session at NCC here last week.

The other executive is the "resource executive," Walker explained, and this person is the executive the manager uses as a service, such as the personnel manager.

"Since 1955 too many people have been concerned with operational control. You should not be addressing this area," he told the group, but should be helping top management make better use of cash, people and resources.

Operational control is single-task-oriented, he noted. Many MIS people attack a problem and ask about the operational aspects. The right way to attack a problem is to understand the plans of the business in which the system will be a part, he noted.

In long-range planning, a management system goal is established and then passed on to the staff people who bring it down to the base of the company, Walker said.

Users should be aware of the architecture of their systems, how "things are going to fit and how the data relates to processes." The top three levels of architecture are the system designer, the application architect and the information system architect. The latter understands the architecture of "where it is you will be taking a particular business."

Valid Data a Must

Remember that "to make decisions you have to have valid data," Walker warned the group.

Describing the system used at Humana, Inc., he said, "too often we have developed a project and data base at each individual level to end up with all that redundant data we have in many of our large organizations."

"I am suggesting you begin to say what is more important" and make sure this doesn't happen.

All resources have four phases to their life cycles. First, requirements are determined; next, the make/buy decisions are made; third, decisions relating to maintenance and control are made; and fourth, decisions relating to the retiring of a system or program are made.

To effectively manage the MIS department, one must begin to understand the business flow and determine the data base, consolidating those operations that use the same data.

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At Humana, the firm had three alternatives in organizing the data and satisfying the user's needs. One alternative was to put a computer in every hospital. This was ruled out because of expense.

The second alternative was a combination of minicomputers and data services. The third alternative was putting minis in the hospitals linked to a large system.

The firm chose Four-Phase Systems, Inc. minicomputers with 32 terminals and installed them in their hospitals. The system at the top was an IBM 370/158 with 1M characters of memory.

The results of this has been to capture lost charges that were formerly forgotten; to eliminate duplication in admissions, data gathering and people; and to save money by going to minis from IBM 1800 systems, he said.

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Cost Savings Held Justification for Planning Effort

By Esther Surden
Of the CW Staff

NEW YORK – "If it doesn't save you money, don't do it," J.B. Gearhart, vice-president and director of management systems for TRW Defense and Space Systems, told an audience at an NCC session on long-range planning for computer usage in large organizations.

Speaking on "Strategic Planning of Management Information Systems [MIS]," Gearhart said the interaction between planning and the environment has an impact on "what your MIS should be."

TRW is firmly committed to a user orientation in management systems work, he noted.

"The set of systems our company has is a total system; we are not reactive; we look upon MIS as a discipline, an aid to managers to get things done," Gearhart said.

This has been easy to sell as a concept, he added.

"You can't afford not to plan in the first place," he told the group. Planning allows a "continual search for maximum payoff with the resources you have to work with," he said.

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When planning, a requirements analysis is the first step – look at how the user organization does the task now and make sure it understands the procedure it is using thoroughly.

The user should be asked what is wrong with the way the project is being handled; then "let the user tell you how he'd like to have it done."

The next stop is to develop a plan to get to that point, he said. Sometimes just the process of analysis will clear up the user problems, Gearhart said.

"You find out that they really didn't understand the interface" between aspects of the organization and so use the data inefficiently, he added.

"Remember," he noted, "people use data, data doesn't use itself; and computers don't manage, people manage."

To look at the user's requirements TRW has established a "requirements tree" to reorient the user's thinking on "how to treat the interface."

A question the planners at TRW asked was "What are the basic thrusts one can develop to help guide the department?" One of the guidelines they settled on was the establishment of modular data bases that can talk to each other and can be processed individually.

The firm is also departing from batch processing and reporting because "it costs too much to print" and "on any given printed report, only 5% of the data is used," Gearhart said.

In addition, TRW has gone toward direct access to data through teleprocessing.

One of the very effective procedures the firm has implemented, Gearhart said, is management by exception.

No reports get printed if the system is operating within a given tolerance; only when the user breaches what is preset as acceptable will the system flag the user and print a report, he explained, adding "this works very well."

"We have found that the more rigorously we standardize the way to do things, the easier it goes," Gearhart said and told the group about TRW's "lead executive concept."

Every project that is undertaken has to have the stamp of approval and guidance of a top-level manager, usually a vice-president.

Not only does this give management a stake in the procedure, but it allows input from the person most experienced in the functions it will serve. This is a specific individual who is responsible for system usage, he explained.

The firm also uses the company's regular audit department to do audits on the system. These give the department knowledge in two areas.

First, they tell if the department is maintaining audit control of the system and, secondly, "you can see if your system is really performing effectively.

"If you can't prove it is really cost-effective, you aren't doing your job," Gearhart said.

At TRW, within eight months after a system is implemented the manager in charge is required to state what degree of savings has been realized and where it has been realized, he added.

"All of this has to be flexible and dynamic to meet changing laws, managers and product lines," he concluded.

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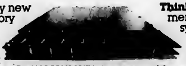
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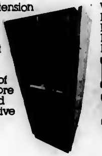
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With Emergence of Specialists

People Costs Seen Taking 90% of Future DP Dollars

By John P. Hebert
Of the CW Staff

NEW YORK – "There is a possibility that, in the future, 90% of the corporate dollars will go to people; we can expect the 'person costs' to assume an increasing portion of the DP budget and we can expect the trend to continue."

That prediction was made to attendees of an NCC session on "Data Processing Career Paths" by panelist William Rothamel of the University of Illinois in a text written by H.W. Bomzer, also of the university's Urbana campus.

Rothamel, who read Bomzer's speech in his absence, said there have been great changes in the DP budget outlays going to support people because of "extreme pressures on the DP organization."

The most recent product developments in the DP area, Rothemal said, have resulted in the emergency of the specialist, a very important individual who receives a salary commensurate with his increasing knowledge.

At the same time, the computer community has been witnessing lessened demands on the data entry person – a product of the same increase in technology.

Both of these types of people make it increasingly clear career paths are needed to determine future directions each individual and company will take, he said.

"The accuracy of data is being entrusted to the person who knows the least about it," Rothamel said. "I can only hope we are smart enough to provide that person with training."

The idea of career pathing becomes more necessary with the rapid changes and increasing pressures afforded by technological improvements, although the objectives to meet this need are very often not under the control of the DP organization – they are usually under the control of management, Rothamel said.

He stressed that goals for DP career pathing should be both stated in clear terms to management and measurable. These include both long-range and short-range goals, he said, adding their implementation must take place within a definite time frame.

"People in any organization deserve to have a viable career in DP by a well-defined path up the ladder and they should be offered the chance to obtain the skills necessary to go up that ladder," Rothamel said.

Data Entry Necessity

Another panelist, Carolyn M. Denning of Pertec Corp., detailed the necessity of career pathing in one particular area – the data entry supervisor.

"Data entry is now a question of throughput and this is when it becomes a respected member of the DP community," she said.

The result of rapid technological advances running far ahead of data entry has made a serious impact on the supervisory level. There was not a concurrent rise in knowledge that went along with the increased specialization brought about by vendors oversimplifying data entry through advanced technology.

"The supervisor had to see the data entered, verified and transmitted properly," but didn't have the knowledge to fulfill his job function if something went wrong, she said.

Calling technology a burden by "leaving the keypunch supervisor out in the cold," Denning noted there were no classes specifically tailored for the key-to-disk supervisor.

"Data entry more than any other area is a people-oriented environment – a very emotional situation," she said.

For this reason, a "generalized education" is needed to teach such things as terminology so the supervisor can communicate with support people and "alleviate the fear of the unknown," she said.

There are many benefits to good operator training from the management standpoint that optimize the quality of data going to the mainframe, she said.

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DP Role in Air Traffic Control Seen Growing With Technology

By Catherine Arnst
Of the CW Staff

NEW YORK – Automating air traffic control, a complicated process which demands perfection, also demands more and more sophisticated computer systems, according to panelists at NCC here last week.

"In the 1920s the controller did his job by waving a red or green flag; in the 1930s he had a radio; in the 1940s he got radar; and now he must start learning to communicate through a computer," Howard McGlauflin of the Federal Aviation Administration (FAA) said.

FAA first initiated plans to develop an automated system for air traffic control in 1961, when a project task force was established. The result was The Project Beacon Report, which recommended the "utilization of general-purpose digital computers to provide controllers with aircraft position information," McGlauflin said.

The eventual result of this recommendation was the Advanced Radar Tracking System 1 (Arts), which has been in use since 1966.

Arts uses a general-purpose digital computer together with video digitizers and displays to increase the radar and beacon video on a controller's console. It operates by displaying alphanumeric aircraft identity and altitude information which is automatically associated with the proper video returns.

A variation of this system, Arts 1A, was implemented in 1968 at Kennedy Airport in New York City and permits the individual airspaces over Kennedy, LaGuardia and Newark (N.J.) airports to be combined into a single operation by utilizing computers. "This system differs from the Arts 1 in that it uses two separate, non-collocated radar and beacon inputs," he said.

The FAA has developed a design for an improved air traffic control system, called Arts III, based on experience gained from the operation of Arts I and 1A, McGlauflin said.

This system, which is currently being implemented at 62 air terminals, is intended to be a first step in terminal automation of air traffic control and to provide an automation basis on which to build, he said.

Arts III was designed to be built with a modular expandable concept in order to provide the capability for growth of system functions at the same pace with increased requirements and developments, he said.

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FCC Decisions on Competition Attacked as Simplistic

By John P. Hebert
Of the CW Staff

NEW YORK – The Federal Communications Commission (FCC) took some hard knocks here last week as a three-man panel cut into the commission's approach to regulated competition in the data communications area.

In essence, all three panelists at the NCC session on "Legal and Regulatory Trends in Computer Communications" accused the FCC of taking an approach that is both simplistic and unrealistic.

In addition, the three, all lawyers, agreed the commission is taking too long to reach a decision on the issues of competition which, they said, affect not only the DP community but also the general public.

The most troublesome aspect of the regulation of Bell and the common carriers lies in the area of cost subsidization, according to Frank J. Martin Jr., an attorney with the Washington law firm of Sutherland, Asbill and Brennan.

When competition is allowed in certain areas, the FCC wants to be certain Bell does not use its monopoly services revenues to subsidize its competitive services, Martin said.

Martin called this cost subsidization issue the "principal battleground" in the communications field today.

"This is a time of great change in communications policy. The events of the last few years have brought about a crisis in data communications policy," he said.

'Critical Situation'

"Trying to keep up with the issues is a great problem, but it is not a unique situation. It is rather a critical situation," Martin said.

This critical situation relates back to the major change which occurred when the FCC permitted the specialized carriers to compete with carriers who had not previously faced competition.

The "common carrier decision" was a deliberate attempt by the FCC to encourage innovation in data and general voice communications by allowing competition, he indicated.

But when the commission allowed this to happen, he added, it did not prohibit the specialized carriers from offering their services wherever they chose.

The result of this, Martin said, was that the common carriers offered their services in the most lucrative areas – in the cities. This upset a balance because Bell had to subsidize rural areas from its lucrative area base.

The most recent FCC decision to wind up in the courts is exactly this subsidization, Martin said, adding Bell is the company suffering most from this decision.

"The FCC is taking too long," he said, noting that, by court order, the private-line case of the FCC's cross-subsidy decision has to be made by August.

"The FCC has difficulty bringing one of these decisions to conclusion" because the other carriers file for hearings on the matter and the hearings inevitably take a long time, he said.

Great Instability

William Malone, a Washington lawyer representing General Telephone & Electronics and a member of the board of directors of the Computer Law Association, said FCC decisions of the past few years have brought competition into an increasingly broad area in this country with the result of creating great instability in the communications market.

"The introduction of competition into the data communications carrier market has forced additional regulation," Malone said, calling this a "failure of the FCC to appreciate the industry it purports to support."

Questioning whether the FCC is properly carrying out its function, he said the commission has been adopted as "religion," with most people putting their faith in decisions made by the regulatory body.

Malone predicted higher prices for all people who use the voice or data communications services because of the FCC decision to allow specialized carriers to compete with Bell.

The Consumer Communications Reform Act now pending in Congress, is called that because even though businesses initially take on the extra cost burdens of higher communications costs, the consumer will be the one to suffer.

Private consumer telephone usage has risen substantially since the Communications Act of 1934 was passed into law, Malone noted. In 1975, 94.5% of all households in the U.S. had telephone service, he said.

If rates are raised for businesses, it will only be a matter of time before the general public is hit with a 60% to 70% increase in telephone rates, he forecast. "This is politically unacceptable," he said.

"The FCC has not established competition in any meaningful sense if the result is to raise all telephone rates," Malone said.

CW
At NCC

The impact this will have in the future will be a throwback to the 1930s. "We will have areas where there is no telephone usage at all." In rural areas of the country, he cited hypothetical costs of $50 or $60 to make a long-distance phone call.

Thomas J. Keller, general counsel for the Office of Telecommunications Policy (OTP) in Washington, D.C., agreed the 1970 decision made by the FCC stipulating there be no regulation unless it was data communications was a "questionable decision."

Even though Keller said the underlying thought of the FCC concerning issues of competition by the specialized carriers was inadequate, he claimed better regulation is is the most appropriate solution to the problems facing the communications industry.

Competition is needed for improved resource allocation, new and as yet unrecognized management techniques and the exploiting of technology in a timely fashion, he said. The removal of restrictions, he added, would prohibit the advancement of technology and promote risk taking.

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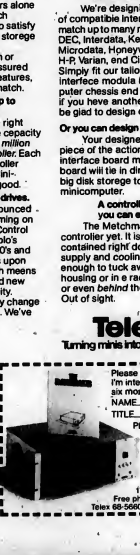

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Editorial

Another Great Job

The largest National Computer Conference — and one of the best — is now history.

And when the history of the shows is written, it will go down in the books as one of the best-run shows ever — which should make the people at the American Federation of Information Processing Societies (Afips) proud.

The show went off almost without a hitch, quite a feat with almost 1,000 booths in the exhibit hall and a multitude of attendees in a hot and muggy New York.

The only problems that arose came from the sheer number of people attending, with long lines the order of the day on Monday and Tuesday as almost 3,000 poured into the convention in those two days alone.

One of the featured speakers couldn't make it for the show, but Rep. Wayne L. Hays (D-Ohio) had things other than computers on his mind during the week.

On the whole, however, the problems did not detract at all from the upbeat show that reflected a mood of optimism in the computer community.

There weren't a large number of startling new products as exhibitors concentrated more on showing well-running and tested systems — giving users proven performance rather than flashy technology.

The wide-ranging technical program, superbly arranged by Stanley Winkler of IBM and Dr. Carl Hammer of Univac, offered something for almost anyone, from in-depth discussion of important social issues in computing to the academic discussion of computers and components that might reach us in the real world in the 1980s.

Exhibitors were happy with the crowds; the crowds seemed happy with the exhibits; and session attendees seemed generally pleased with a minimum of the normal complaining about a few of the specific meetings.

Overall a great show — and another great job by the Afips crew.

'I Always Said Somebody Should Have Complained When They Started With Supermarkets . . .'

Letters to the Editor

Let ACM Election Results Speak For Themselves; On With the Job

When Herb Grosch was good enough to show me the advance manuscript of his May 31 column, I asked that he make some changes in the references to my nomination for vice-president of the Association for Computing Machinery (ACM).

He agreed to try, but warned me the deadline has probably already passed.

My concern was with the motivations attributed to the nominating committee for not nominating me. Frankly I don't know what their motivations were and don't intend to ask, but I doubt very seriously it had anything to do with fear of me as a non-Establishment candidate, whatever that is.

For myself, I would prefer to let the election results speak for themselves. I hope it will be possible to bind up any wounds caused by the campaign, but otherwise I have in mind to forget the past and get on with the job.

Daniel D. McCracken

Ossining, N.Y.

SSA Building to Pay for Itself

As the consultant who made the original recommendation that the Social Security Administration (SSA) build a new computing center, I am appalled by the nonsequiturs recently floating through the press, including *Computerworld*.

SSA's computing is a lot less efficient than it could be if it carried out most of the General Accounting Office's (GAO) suggestions in the Morris Report of a few years ago. That report called for a modernizing of processing methods to emphasize selective on-line processing and for improving its sequential processing.

Both improvements would affect computing personnel costs as well as hardware costs. Each of those costs must now be greater per year than the capital cost of SSA's proposed building. Both improvements need a respectable geographic layout of hardware. Over its useful life, the efficiencies possible in the proposed building would recover its cost many times over.

SSA's proposed building was planned as I suggested so that its space is interchangeably usable, as their DP methods evolve, for hardware or office space. When feasible, starting several years in the future, decentralization could improve both security and efficiency.

Locking SSA into its present space box would not save anything, only inhibit the kinds of improvements in efficiency and security that are needed.

Herbert S. Bright

Bethesda, Md.

Improving on 'Peopleware'

In response to the request for suggestions for a more appropriate marker than "Peopleware," I submit "Humanities."

I find the term "Peopleware" offensive and particularly unsuitable since we are so often accused by non-DPers of trying to dehumanize everything.

Humanities is a recognized and respected field of study in institutions of higher learning; there is no reason it should not be in *Computerworld.*

Thomas Pawlick

Rochester, N.Y.

(Other letters on Page 26.)

Data Past

Five Years Ago
June 16, 1971

HAWTHORNE, Calif. — U.S. Navy Commander Grace M. Hopper renewed her fight against what she called mammoth computer systems, operating systems and management data bases at the joint meeting of Los Angeles Association for Computing Machinery and Data Processing Management Association members. "Operating systems can be eliminated by having modular minicomputers handling delegated sections of programs," she said.

– – –

WASHINGTON, D.C. — A tariff proposal with less stringent protective requirements was to be filed this month by AT&T with the Federal Communications Commission (FCC) in response to objections by data users to AT&T's Connecting Arrangements for voice-grade private lines.

Eight Years Ago
June 12, 1968

NEW YORK — A state judge here ruled Western Union (WU) breached a contract with Law Research Services, Inc., the first customer seeking to offer a computerized legal research service over WU's teleprinter network, after finding WU had delayed putting data into the computer's memory devices, delayed in supplying billing tapes and had raised prices it would charge the research service for WU's services. Law Resaerch claimed a $37 million loss as a result of the WU actions.

– – –

NEW YORK — Dr. Bernard Galler of the University of Michigan won the presidency of the Association of Computing Machinery over publisher Richard Canning, succeeding the retiring president, Dr. Anthony G. Oettinger of Harvard University. Walter Carlson of IBM won the vice-presidency over George Glaser of McKinsey & Co.

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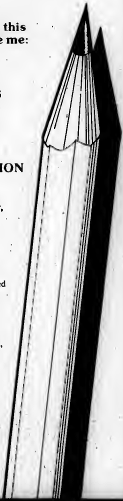

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Japan I

To paraphrase Kipling, "But there is neither East nor West . . . /When two strong companies stand face to face, though they come from the ends of the earth!" Those ends would be Armonk and Kawasaki, in the context of a great trip I've just completed: Armonk you all know, and Kawasaki-shi is the principal seat of Fujitsu, just outside Tokyo. I certainly won't be able to crowd all my impressions, personal and technical, into one column, but I'll start today, putting aside my anticipations of the NCC.

I was invited some months ago to address the big annual meeting of the Facom Family, the combined (SHARE plus GUIDE) user group of Fujitsu, at its Nagoya meeting May 28-29. It was my first trip outside of Tokyo in some years, and my first trip ever under purely Japanese auspices. I went first at my own expense, back in 1961 when the idea of computers was brand new in the country, then later for Univac, for the U.S. government, and of course for *Computerworld*. Each time the commitment to a national position in computer development and production was more evident; each time the users were more sophisticated; each time IBM concern was more obvious. I expect to go many more times (this was my sixth); nevertheless, and in spite of the shortness of the visit, this trip was a high point.

For one thing, I penetrated deeper. I not only toured the huge Nagano factor, where the bread-and-butter Facom 230-series medium-sized systems are made, but I was allowed a good look at very advanced research at the Kawasaki laboratory complex. My wife and I had been given an enormously impressive excursion through the Fujitsu LSI production facility, one of the largest in the world, during the U.S.-Japan conference last August – probably to prepare me for the Facom Family invitation! Anyhow, taken together, the three tours gave me much better perspectives on one of the great world computer enterprises.

That was the second thing. Although of course the overseas marketing people were careful not to compromise future adventures by talking too freely, I was pretty thoroughly immersed in hopes, intentions, and accomplishments beyond Japan. The ministries and the individual companies have always been very generous, at IFIP and U.S.-Japan conferences, at the OECD in Paris, and in the media; they not only overwhelm with multifarious data, but they present it handsomely, and in English. This time, though, I was shown what one company saw in Eastern Europe, in Spain (where they have had a recent major success), and in their relationship with Amdahl. Knowing my interest in big systems, they loaded me down with brochures on the big bank network, the Japanese space program, their interaction with Nippon Telegraph and Telephone, and such. I'll be reading it for months!

I flew to Tokyo overnight, from Los Angeles – not the best way to go. Trouble was, I had accepted an invitation to speak at the ACM/ASM Annual Spring Seminar Saturday the 22nd, with the intention of taking the mid-afternoon Pan Am nonstop flight. Then, after both dates were firm, Pan American changed its schedule to depart much earlier, and made the red-eye via China Air Lines necessary. Just one more example of short-sighted and selfish airline sales policy; everybody wants to clump up at popular departure times – the 5PM-out-of-O'Hare syndrome. Domestically it overloads the facilities, and internationally it limits the itineraries; one more example of greed-before-service.

You don't see it yet, or at least not so openly, in Japan. Prices are astronomical: five bucks to clean a (two-piece) suit. But in three hours, if you need it, and laundry the same. Everywhere, even in Tokyo, you feel the struggle to maintain the amenities, to live well together. Costs go up, yes; they go up in New York and Chicago and Topeka also, and we get Mucilaginous Macs, and punks instead of trained help. Ah, well!

There are 36,000 computers in Japan, far more than in any other country except our own. Their growth rate for the last three years, in numbers, has been only 20 per cent annually – down, largely due to the petroleum depression, from their historical 30 per cent. But the growth in dollars – yen, I should say – has been higher, indicating that the miniwave has not yet hit. The nature of Japanese enterprise, and the well-known willingness to cooperate, to accept organizational decisions, makes the continuing economies of integrated data processing still attractive, and the DEC-encouraged pride ("think how nice it would be to have my own setup") in decentralized installations less defensible. So, growth is still stupendous. The limit is production of trained personnel; there is absolutely no jobhopping, so it must be *new* personnel; poor performers are not fired, so selection and training are vital. To get ahead of my story somewhat, women are increasingly recognized as a major personnel resource; there were five registered at the Nagoya user conference, out of eight hundred; at a similar meeting, and in Tokyo at that, seven years ago, there were none.

I had a short but to-the-point meeting with the new president of Fujitsu, Taiyo Kobayashi, and his top administrative VP, Shoichi Akazawa. We talked about IBM, about research support, about a recent visit I had made to Fujitsu California, about Europe. And, more socially, I had a final chance to report to him on my tours and my observations at the magnificient drinks-food-and-beautiful-hostesses Fujitsu reception following the first day of the user meeting; one gets a lot of business done in Japan at such functions, in spite of the great sake and beer, and the free-flowing and enormously expensive Scotch.

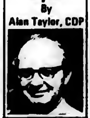
Herb Grosch

Models Show Systematic Method to Handle Exceptions

The Taylor Report

By

Alan Taylor, CDP



Last month in England a judge stopped a case in mid-trial and excluded the public from the court. Then he granted a search warrant-type of order against some people believed to have a 32-page computer printout belonging to Vapormatic Co. Ltd.

Both these actions basically violated some pretty fundamental rights and, in his written reasons for these actions, the judge concerned, Justice Graham showed the basis of some systems work that many computer systems people should ponder.

What apparently happened was the computer printout contained the names of the worldwide customers of Vapormatic. This is pretty explosive stuff, and, with computers' capability of copying tapes, etc., it is now much, much harder to ensure that security is maintained.

It is not sufficient now to see that all copies of the lists get locked up at night, because one really doesn't know whether there are some other, unauthorized or perhaps out-of-date copies of the list around.

In this case, the problem was how to get the list back without putting the people on guard – and to do this properly. So a number of actions were taken systematically.

To protect against advanced warning, the court went in camera as soon as the judge realized what was being asked. As he wrote later, he should have been asked privately, but he was not.

Next, the order, which involved searching the premises of another firm, had to be carried out "satisfactorily, though with due circumspection and proper regard for the defendants' rights" as the judge later put it.

What does that mean in computer terms? It means that when an exception is made – some edit omitted or a test ignored – further actions shouldn't continue down the main path as though nothing has happened. Special procedures for the specific type of case are needed.

For instance, if a name-duplication system suggests there are two master records for the same person, and it is decided to consider them as one, some thought has to be given on how to handle matters should the assumption turn out later to be incorrect.

Fingerhut, a Minnesota firm, is a particularly good example of how to handle that sort of situation. It has a policy that restricts to one the number of customers in a household, but of course they cannot really know what is a household.

So when an order comes in apparently from the same household, but with a different name, out comes a computer-generated letter to the original customer, telling him about it.

Like all of Fingerhut's items I have seen, it is an exceptionally well-drafted letter. First, it tells the person that the order for XYZ has been received and that the goods will be on their way shortly. Logically, it is a quite unnecessary piece of information, but it puts the people concerned at ease. They know there has been no delay.

Then the letter goes on to explain about Fingerhut's policy of one customer per household. It does it quietly and doesn't try to blame the computer for being unable to handle it or to pretend in any other way it is not just a matter of the firm's choice. I like that too, even though it is unnecessary.

Now comes the real part of the letter – it reports action. What is happening is that the new order is already being placed on the original account. Now it is clear why the letter has come to the original account holder, because it is his bill that is going to show the item. Finally, the letter offers to reverse the action if requested.

The policy, it turns out, is not iron-clad. Indeed, to reverse it, only a request is needed. But a request is needed, so now the letter says that, if joining the two accounts is all right, no action is needed, and the matter can be put in the waste paper basket.

But, if the customer wants it reversed, he is asked to let Fingerhut know. And that's the end of the letter.

Now compare that with the procedure in the judge's court.

Dealing with matters a great deal more important than the merging or separating of two mail-order accounts, he followed much the same path. Like Fingerhut, he acted. And, again like Fingerhut, he published his reasons for acting.

The judge ordered very specific precautions to be taken. An attorney was to be present in his capacity as an officer of the court, apparently taking personal responsibility for seeing that everything went off all right. Somewhat similarly, the Fingerhut letter also came from a third-party outside the marketing or the accounting areas (in this case, customer service).

And, as well as just providing for the attorney, the judge wanted any experts who could identify the computer printout or help to find it (perhaps now concealed on tapes or disks or reformatted) to be actually named right in the order authorizing the search. There was no equivalent to this in Fingerhut's effort, but then I can't see any equivalent need.

Even then, the judge was not really satisfied that everything possible had been done. He noted that the result eventually might be an award of damages against Vapormatic itself, perhaps for damage that occurred when it saw the other parties' customer lists. This is equivalent to the Fingerhut offer to reverse the merging of the two accounts.

So, as you can see, there are models of how to handle exceptions both in and outside the computer area. And they fall into a pattern of sorts.

I think it is a practical procedure in almost any case where someone suggests skipping edit checks (for efficiency purposes) or otherwise tries to shortchange safety or standards. Look at the real amount of work involved in changing matters over, and think of the abuses that can occur if the work isn't done properly.

The systems built around decent exception procedures will run a lot easier than some of the efforts we see around today. And, really, done systematically, as both Fingerhut and Justice Graham did, exception handling doesn't take very much work at all.

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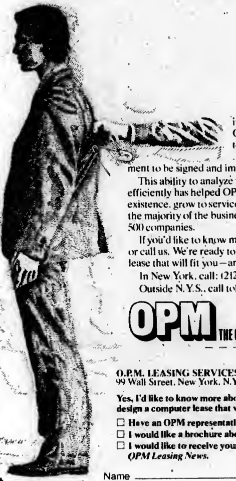

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Letters to the Editor

Hard Sell Not Only Method Of Getting UPC Acceptance

I have been following with interest and bemusement the ongoing drama in *Computerworld* concerning the Universal Product Code (UPC).

First there was the shock of realization that the public wasn't accepting the UPC because it wanted to see prices. Then came the bewildered questions of "why" and "who," followed by finger pointing, breast beating and hair pulling. Everyong seemed ready to junk the whole concept, and then Ray Kaplan spoke up in favor of hard selling the UPC to the American people [CW, May 17].

Personally I do not think even a hard sell (a costly proposition, make no mistake) would work for the UPC as it is now structured because the consumers are always going to want to know what they are paying for something before they buy it. Would Kaplan buy a car or a house without knowing what it would cost him?

There is too much to be said, however, in favor of the UPC for it to be dropped. Easier inventories, faster service and (hopefully) lower prices to the consumer because of lower costs for the wholesaler and retailer are arguments that should weaken even the most ardent UPC opposition.

What no one seems to have realized is that we can have both by going ahead with the implementation of the UPC, ending the practice of marking every individual item in stock and beginning the practice of marking groups of items (e.g., with a label on the edge of the shelf directly under the items being priced).

Jean Vermette
S. Fallsburg, N.Y.

POS Picture Too Rosy

I had some difficulty in determining the objectivity of "Ohio Market Ends Most Price Marking" [CW, May 24] since this story on point-of-sale (POS) usage in a Troy, Ohio, supermarket painted a rosy picture which differed greatly from one published by the *Dayton Daily News* a few months ago.

As I recall that article, there was much customer dissatisfaction both with the lack of marked prices and the checkout procedure, and customers were going to other stores rather than stop at that store.

I depend on objectivity in *Computerworld* articles and this one makes me suspect others of its type. I hope CW's reporters will try harder to get all the facts.

Carl M. Vigil
Wright-Patterson Air Force Base
Ohio

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IMS-Based 'Daisie' Blooms as N.C. Welfare Support

By Julia Van Duyn
Special to Computerworld

RALEIGH, N.C. – From the seed of an idea planted last fall, Daisie – the Data Assistance Information for Social and Income Eligibility system for the state of North Carolina – has nearly reached full bloom.

It went into pilot production use late last month, according to Earl Wells, the state's DP manager for social services.

An on-line, real-time inquiry and updating system built around IBM's IMS and a 370/155 using OS/VS1, Daisie provides a network reaching out to 100 offices in the various countries in this 500-mile long state.

Ultimately the system should replace much of the paperwork and reduce the delays that plague any program as widespread as Medicaid, Wells said.

The need for such an automated approach was sensed last year by David T. Flaherty, the state's Human Resources Secretary, and Wells was given the assignment on Oct. 13 – "I remember that date: It wasn't a Friday but . . . ," Wells recalled recently.

IMS was selected as the vehicle because of its ability to handle many concurrent data communications users as well as provide support for the complex data base Wells anticipated he would need.

Two other state agencies were already using IMS on the same 155 Wells expected to use, and that may have been the most basic reason for focusing on that particular data base management system. But even after the decision was made, the path through design and coding to implementation was harder than anyone expected.

A Way of Life

With a crew of 16 working on the project, overtime became a way of life, Wells said. He personally accumulated 300 hours of "comp" time which he can take off "whenever I have time – and you know when that will be."

The design work was hampered by a lack of working knowledge about IMS, he went on. As an example, he noted that when the client data base – the first of half a dozen or more needed for Daisie – was first set up, the client's name and date of birth was made the primary index, while the client number was secondary.

This organization was soon found to be too cumbersome and the indexes were reversed. But that entailed changes in "just about every program," Wells explained.

More than that, there were errors within the IMS coding, he said, adding his site has been the originator of "a number of IMS patches" in the past few months.

Some odd situations come up even when his crew isn't deliberatley testing the system; recently it had two logical terminals working at one physical terminal and each was being used in conversational mode. IMS finally couldn't figure out which message was supposed to go which logical unit, "so the system died."

Sometimes the hardware limitations frustrated Wells and his colleagues. The 155 originally had 1.5M bytes of main storage and Wells anticipated a need for 2M bytes to support Daisie.

But one day, the development team "turned the users loose" and told them to "beat the thing to death," Wells said.

Half an hour later they had done just that: they had filled all the queues with legitimate but slow-moving requests – inquiries for client files based on phonetic input of last names, for example – "and so the system just plain died." That led to a request for another megabyte of memory, Wells noted.

Meanwhile, as coding went forward, the state prepared for the Daisie-user interface. Health Applications Systems of Burlingame, Calif., already under contract to North Carolina for other work, was hired to prepare a user manual. "Working with very few of our people, it did a fine job," according to Wells.

The operators who would work with the Olivetti CRT terminals out in the field offices had to be trained, and the access methods they would use had to be tailored to their nonprofessional backgrounds.

"Menu" screens listing the various options open to them and "Help" screens for when things really seemed to be out of hand had to be included in the software; function keys that would be useful in simplifying their input had to be added to the terminals.

'Hawkeye' Standardizes Cobol Coding

CHICAGO – Hawkeye from Blackhawk Data Corp. is basically a text editor, processing the text of a Cobol program one word at a time and formatting it in accordance with a set of general rules, a Blackhawk spokesman said.

Sometimes described as a Cobol standardizer, Hawkeye supports the use of substitution tables so that specified words or phrases in the original source code can be replaced by other specified words or phrases in the reformatted program.

One use of this facility would be to equate several data names, for example, with a single name if several modules written by different programmers are being brought together into a unified program, the vendor suggested.

Alternately, it has been used to "translate" programs from one user language to another. A sample provided by Blackhawk showed just such a conversion from English to Spanish.

Still another use would be to provide a null set as the replacement for an undesired word or phrase, thus effectively deleting it from the updated program, the spokesman added.

Other Capabilities

Other capabilities provided by Hawkeye include the possibility of assigning numeric prefixes in increments of 10 to Procedure Division paragraph names. All references to the newly numbered paragraphs are amended by Hawkeye without user intervention, the vendor said.

Other formatting niceties provided by Hawkeye include indenting of Data Division-level number entries and Procedure Division statements according to predefined rules, skipping to a new page at the start of new divisions or sections and the insertion of blank lines before Level 01 entries in the Data Division and paragraphs in the Procedure Division.

Under a so-called Cobol Laundry service, Blackhawk will run users' programs – preferably in batches of 10 or more – against "Hawkeye" for a predetermined cost per line. This would give users a chance to see how well the conversion works or just use for libraries too small to justify acquisition of the package itself, Blackhawk said.

Otherwise, the package is available for in-house use on any IBM 360/370 or other installations with an ANS Cobol compiler for a one-time cost of $1,800.

Blackhawk Data is at 200 N. Michigan Ave., Chicago, Ill. 60601.

'Compumap' Data Base Enhanced To Improve Truck Route Plans

WELLESLEY, Mass. – An extensive revision and updating of the data base used for calculating the shortest practical truck routes in the continental U.S. has been built into all the Compumap products now available from Logistics Systems, the vendor said recently.

Designed for use by trucking common carriers and private fleet operators, the data base provides users with a selection of "thousands" of origin and destination cities and "millions" of possible routes over interstate, U.S. and principal state highways, according to a spokesman.

The system now indicates toll roads, favors interstate highways for fastest routing and constructs routes around rather than through cities, he said.

Output shows actual highways used, describes route junctions by the compass direction from the nearest city and indicates anticipated travel time for each leg of a trip, he continued.

Special routes that must include intermediate stops for shipment drop-offs, rest stops or other company-specified requirements, can also be constructed with the Compumap system, Logistics claimed.

In addition to plotting routes which may save users 3% to 5% of their current mileage per year, Compumap provides a printout showing total miles traveled, subdivided by state so that state fuel use and highway taxes can be figured accurately, the spokesman added.

Compumap services are available in five forms. A custom service detailing a limited number of repetitive routes is available by origin, destination and other requirements specified by the user. Printed in loose-leaf or hardbound form, it costs $10/route.

At the other extreme, Compumap/On-line is available for installation on a user's large IBM 360/370 operating in a real-time on-line mode under CICS. This version costs $40/mo per tractor unit in the user's fleet, subject to a minimum cost of $300/mo and a maximum of $1,500/mo.

Logistics can be reached through Box A, 60 William St., Wellesley, Mass. 02181.

Software Lets Mini Tie to 'Swift' Net

NEW YORK – Software packages now available from Arbat Consultants of London or Arbat Systems, Ltd. here permit banks that are members of the Society for Worldwide Financial Telecommunications (Swift) to operate Digital Equipment Corp. PDP-11s within Swift guidelines, according to an Arbat spokesman.

Presently Swift management suggests banks utilize Burroughs, General Automation or Singer systems in the international operation. But the operating system, Aims-11, and its application package, Swift-11, have changed that, Arbat claimed.

Aims-11 was described as a high-level programming language similar to Basic; Swift-11 was developed to make existing PDP-11s compatible with Swift's data communications requirements, Arbat said from 61 Broadway, New York, N.Y. 10004.

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New Jersey Team Finds:

Light-Hearted List of Hazards Eases CICS Checkout

By G. Victoria Babish

Special to Computerworld

The following is a list I compiled of common - problems encountered with IBM's Customer Information Control System (CICS). I think the situations are examples of Murphy's Law applied to CICS-DOS/VS Version 1.1.1 operations.

Because the list is humorous, our team members laugh when they read it – but they do read it. The list is especially valuable because the mistakes have been made once or twice and not continually.

Here's the list:

1. If you think it takes five times to fix an idea firmly in your mind and you write MOVE TCAFCAAA TO TCTTEAR five times and then think when you write it in your program it will be the sixth time and you couldn't possibly make a mistake, you will leave out the crucial last A and bring down the system.

2. If you train yourself to always write TCAFCAAA, you will use that after a file control GET and have inexplicable data in your inquiry maps.

3. The program that worked fine with one record will use up all available core with 10 records because you forgot to release the area gotten for you by DFHFC.

4. If you always release core after DFHFC, you will release it after a GETNEXT and your next record will be placed in the supervisor and bring down the system.

5. The program that worked fine with one error condition will use up all available core with 10 error conditions because you forgot to release core used for error maps that were acquired with separate GETMAINS.

6. If you wrote three transactions and remembered to use large areas for large maps in all three and then write a quick transaction to test light pens, you will forget that small input will arrive in a small TIOA and use the small TIOA to return a wealth of data and bring down the system.

7. The program that worked fine with one terminal will use up all available core with 10 terminals because you forgot to specify no exclusive control and all records are awaiting updating.

8. The program that worked fine because you never did 10 of anything will cease working when system engineering reduces the virtual storage allocated to the production partition.

9. If you faithfully established addressability before each map use except in the obscure ease where someone entered a wrong response and then entered a PF key and then the enter key, the director will use your transaction to demonstrate how goofproof the system is and it will bring down the system.

10. If you are so used to writing BMS macros that you know the "no input" condition is tested with the MAPFAIL option and you always use the included versions of BMS error checking and one day in a hurry you code the macro with no branch to the CHECK routine, you will enter no data through the simple expedient of pressing the PF key and be in a loop and have to request the operator to cancel the partition.

11. If you always test your transaction with a simulator before putting it on the terminal; you will submit the job described above for an evening test and it will run the whole time someone is creating a Vsam data base and cause the file create to take three times longer than estimated.

Mix of Hipo Charts Leads to Confusion

By Joe Celko

Special to Computerworld

I have to disagree with Edward G. Yourdon in regard to IBM's "Hierarchy, plus Input, Process, Output" (Hipo) [CW, May 21]. I don't find it to be much of a documentation aid at all, thanks to some strong flaws in it and not because of how it's used.

First, there are two kinds of diagrams and they are read two different ways. You can have a horizontal chart with a lot of arrows crossing over each other, going to sub-subblocks. And then you can have a hierarchy chart that you read up and down instead of across.

Consider the first case of the horizontal block diagram. It has arrows of two different types to show two different flows of control.

The examples I saw of a Hipo chart in the U.S. Air Force series on structured programming should have been some of the best – they were done by IBM on a big important project that would have great visibility. But, frankly, they didn't show me anything at all – the English was easier to figure out.

The hierarchy charts are easier to read and could replace a Gant chart or Pert chart for program planning, but I ran into a problem with them – no control flow was shown at all.

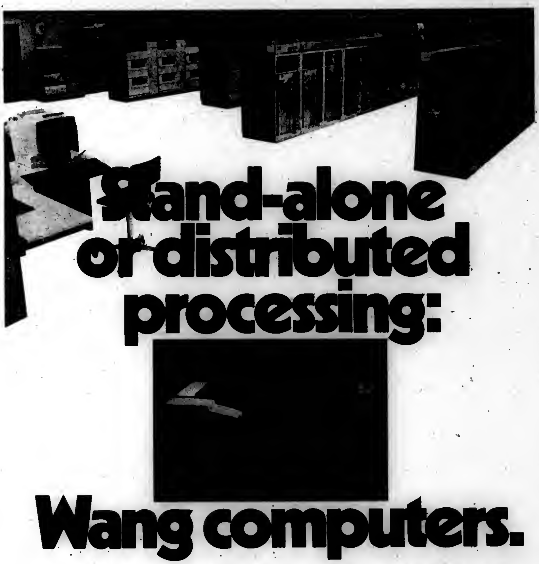
If, for example, we have Task A above tasks A^1 and A^2 in a chart, does A require both A^1 and A^2 or does it require either A^1 or A^2 to execute?

We don't know from this chart, and the IPO diagram cannot tell us either without getting a bit tricky in its process section.

The way I've seen this drawn is to have a box that edits the input to yield a valid record that goes to the guts of the process block or to add a block of "preprocessor" code to the hierarchy chart that explains tricky control.

I also don't like the idea of having two types of diagrams in the same system – it's called "the principle of least surprise." All it means is that you don't throw the reader any sudden changes in his visual input.

Please don't think that I am wildly happy about the Ansi flowchart system, which encourages GOTOs and lots of arrows jumping all over the place. Perhaps the final answer is in doing code so clear you don't need to draw a picture to explain it.



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Plan Increases Value of Measurement

By Barry A. Stevens
Special to Computerworld

Many installations have most of the basic elements of a complete performance measurement program in place. Usually, however, formal procedures do not exist to tie these elements into a workable plan.

Performance Evaluation

Such a plan would feed information to the several organizational groups responsible for performing the basic management tasks necessary to run the DP business.

These tasks – delivery of services, forecasting, resource planning and pricing, operational analysis and improvement, management reporting and user billing – require accurate, quantitative information describing the flow of work through DP.

The degree to which a measurement plan is tailored to meet the needs of these tasks determines in a large measure the effectiveness with which they are carried out and, ultimately, the effectiveness of the measurement plan itself.

While working with installations throughout the industry, it has become obvious to me that most of the elements of such an overall program are usually available.

Workload forecasting information is generally collected and used to estimate resource requirements for the forthcoming budget period. An equipment and staffing plan is prepared and, when resource plans are accurately known, a budget is prepared for the year; information is collected about resource use and is made available as needed during various types of analysis activities.

Data center service levels – the timeliness, accuracy, cost and reliability of data center processing – are observed and quantitative data describing these overall performance, and circulated to the rest of the organization as required.

Not Distinct Problems

Each of these activities is, however, usually treated as a separate and distinct problem. Data from a measurement program is very seldom used to guide the forecasting process; users are often asked to forecast their resource requirements in machine-oriented terms, such as elapsed processing hours or CPU or CRUs, with little guidance provided through measurement which could relate these somewhat esoteric units with more familiar application-dependent units such as checks, invoices or boxes of goods in a warehouse.

Data center service levels are often not taken into account when projecting capacity requirements. As a result, when workload increases, as predicted, and service levels degrade, as can be expected, there is shock and occasionally panic as performance improvements are sought on a crash basis.

Each area described above proceeds independently, as user and organizational pressures demand, profiting little from the information available to or produced by the others.

Generally, a one-day review of existing measuremnet practices at an installation by a qualified external observer is sufficient to highlight the good areas of existing practice and to identify opportunities for improvement.

Specific measurement activities and procedures can be suggested which, if implemented, build toward a complete set of information for the mansgement tasks described above.

The external viewpoint is mandatory; often, installation personnel is tied up with immediate and pressing problems and has neither the time nor the inclination to step back and take the "big picture" view of operations. The time spent in such a review has been proven a good investment.

Stevens is an indendent consultant specializing in performance measurement and evaluation. He can be reached at 191 Mt. Airy Road, Basking Ridge, N.J. 07920.

Human Interaction Theme of Workshop

NEWTON, Mass. – "Human Communication in EDP Systems" is the title of a three-day workshop to be presented by Gerry Richardson of Richardson Associates, Los Angeles, at the Holiday Inn here June 21-23.

Sponsored by Ware Associates, the course is intended to teach participants to communicate productively with other people. Content of the three days will be of use primarily for systems analysts, systems team members and concerned users who want to improve their communications skills, Richardson said.

No Lectures

Although not a lecture seminar, the course will cover a series of topics ranging from preparation for productive communications and influencing others to be receptive to gathering accurate facts for decision making and user participation in systems improvements, the Ware announcement said.

Initial instruction, practice and individual coaching make up the learning format and enrollment is limited to 30 participants, the sponsor noted.

Sessions will begin at 9 a.m. and conclude in the "early evening" each day, Ware said. Cost of the course is $395 with discounts for multiple attendees from the same organization.

Ware Associates is at 38 Main St., Hudson, Mass. 01749.

More DBMS Advice

PENNSAUKEN, N.J. – An information service designed to assist administrators in installations working with data base management systems (DBMS) is now available from Auerbach Publishers.

Auerbach Data Base Management (ADBM), a single loose-leaf volume, covers the basic components of a data base environment, planning and design considerations, evaluation and selection of a DBMS and profiles of current offerings, Auerbach said.

There are separate sections on the data base administration function, the user-system interface and the data model and DBMS architecture as well as analyses of current trends.

An annual subscription, which includes bimonthly supplements of four to six reports, is available for $175, Auerbach said from 6560 N. Park Drive, Pennsauken, N.J. 08109.

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Cooperative Development of Software Seen Better Than Current Approaches

By Anthony C. Constable

Special to Computerworld

Almost everyone is familiar with one of the several graphs that depict total DP budgets over the last 10 to 15 years. The story these graphs tell is that as fast as the hardware dollar buys more, the software dollar buys less . . . and less . . . and less.

The whys of this situation seem at first glance to be easy to explain away – we have inflation to contend with, the latest technology to employ in order to remain in the mainstream and we have to automate more to remain competitive.

I agree with these reasons. However, if we look at the 10 largest banks, insurance companies, oil companies, etc., we find that, apart from names and locations, their products and services are almost identical.

When we look at the applications software for their computers, the similarity comes to an abrupt end, not because their hardware is different but because all of their internal idiosyncracies have been written into their software.

Is this a luxury for which large companies are willing to pay ad infinitum? I, for one, think not, and here is what I feel needs to be done.

'Revolution' Possible

The "canned" software package is here to stay – I have no argument there. However, software packages have almost without exception lagged behind technology due to the undercapitalized nature of the average canned software package vendor.

What is needed is a change of attitude and the birth of a new industry which I shall christen the "software cooperative." With this vehicle, the path will be laid for a new era in automation which we will retrospectively call "The Software Revolution."

In addition, the age of application software professionals will emerge to give us the general surge in business software development that has occurred in hardware development. Remember that most programmers are hacks!

How does the software cooperative work? Let us make the assumption that a software cooperative named International Business Software (IBS) is a thriving, dynamic company with a relatively fat order book. Let us further assume Mr. X, the top DP man for a large Fortune 500 company, is given the cost estimate for the rewrite of his company's personnel/payroll system, which amounts to a mere $2 million.

Mr. X has heard of IBS, but has never done business with it. He calls it in and explains his situation; IBS agrees to help him. This is what happens:

- For an initial fee of perhaps $20,000, IBS undertakes a meticulous search for companies with similar needs that may have put off such a rewrite because of the cost or are otherwise candidates for such a joint venture.
- If "mates" are found, then:
  1. A "common bond" contract is entered into by all participants ("n" heads may be "n" times better than one).
  2. The price will be geared to the individual participants; deviation from the norm in terms of special requirements and features would be extra, but would be significantly less than the cost for which any one of the participants could duplicate the product in-house.
  3. Participants would be entitled to royalties on sales made of software in which they had participated financially. This would encourage the adoption of new ideas.
- If no "mates" are found, then Mr. X has gambled 1% of his estimated total cost against a possible savings of maybe 70%, or $1.4 million!

Other Considerations

How does maintenance get handled? Here I think is the *coup de maitre* of the software cooperative. Maintenance would be conducted at the level required by all participants and the cost would be split equally (or equitably).

It is easy to see how much the reduction in in-house development costs, royalties and costs for continued maintenance and enhancements adds up to everyone involved.

Where is the development done? The development will be done centrally at the cooperative's home office, where the latest CPUs and software will be installed.

Project progress meetings, training and market research data will be available at the cooperative's facility, which will be designed to maximize creativity and efficiency. All of the latest techniques will be employed to produce systems and documentation that is second to none.

How do you convince people that cooperatively developed (and therefore, to some extent, standardized) business applications are viable? The answer is: with enough savings. While many may doubt this, I have been able to learn from top DP management that many companies are becoming "DP poor."

Where will it all stop? The computer utility will become a reality! Impossible, unlikely, unconstitutional. . .maybe, but does any company (apart from the utilities) provide their own telephone, electricity, gas or water systems? Of course not. But everyone uses them, not just because they are there but because there are no real cost-effective alternatives for the individual organizations and because they cannot do business without any of them.

How does the concept differ from canned software? Software that is canned is the most expensive software in the world and here is why: Someone has a good idea. Someone programs it. Someone sells it.

Thereafter, a staggering 80% of all revenue goes into marketing and very little very goes into continuing development.

There is a crying need today for all manner of software systems to handle problems such as automatic retrofitting for MVT programs in an MVS environment or measurement that prevents the initiation of job patterns that are unsociable.

Where are the vendors? They are still marketing Autoflow, Duo, Scert and numerous other Dodos that should have become extinct!

Could Become Reality

Since in this case this particular Muhammed has no particular interest in coming to you with such a proposition (you are a large and relatively conservative mountain when it comes to business software), perhaps you will bring the mountain to me in the form of questions, proposals, resumes and leads.

Please address the mountain to Anthony Constable, Constable Associates, Inc., P.O. Box 1227, Mendocino, Calif. 95460.

If the general indication is that my thoughts are echoed, I will do two things. First, I will write a follow-up article summarizing the responses I receive and secondly I will form IBS.

DEC Publishes 'Ideas'

NORTHBORO, Mass. – A publication titled *Index and Description of Educational Application Software (Ideas)* is now available from Digital Equipment Corporation.

The book describes more than 100 application packages for use on DEC systems and many other CPUs supporting Basic and Fortran programming languages, the company said.

Almost all packages are written in Dartmouth Basic, Fortran IV, or Basic-Plus (DEC's extended Basic). Each description includes information on source computer language, minimum educational level, ordering information and service charges or prices at press time, a spokesman noted.

Ideas costs $10 prepaid, including postage and handling, and can be ordered by requesting the *Ideas* book, Part EA 05857, from DEC, Communications Services NR2/M15, 444 Whitney St., Northboro, Mass. 01532.

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One Year After Introduction

Decnet Architecture Operational on Over 40 Networks

By Ronald A. Frank
Of the CW Staff

MAYNARD, Mass. – One year after its introduction, the Decnet communications architecture from Digital Equipment Corp. is operational on more tban 40 networks.

Although a few deadlines have slipped by several months, the implementation of Decnet essentially is proceeding as scheduled, according to Nathan Teichholtz, product manager for networks and communications at DEC.

Most of the Decnet networks in operation concentrate on interprocessor communications; the next big implementation phase will be to introduce terminal support to the communications architecture, Teichholtz said in a recent interview.

The link protocol called the Digital Data Communications Message Protocol (DDCMP) is operational in about 100 CPUs and is being used in such real-time applications as data acquisition and process control as well as time-sharing, he said.

One major addition to DDCMP is called DMC11, which Teichholtz described as a firmware version of the link protocol software. It provides synchronous transmission capability "to any DDCMP device" and down-line loading of remote unattended processors and operates at speeds up to 19.2 kbit/sec.

DMC11 supports most PDP-11 software including RSX-11D, -M and -S; RSTS/E; RT11; and IAS. Limited quantities of the firmware are now available for $2,145, he said.

The Network Services Protocol (NSP) layer of Decnet has thus far been supplied to users "in subset form" with only point-to-point routing capability. The future completed design will include a route-through packet-switching scheme to handle logical binks, also known as virtual circuits, Teichholtz said.

NSP, when fully implemented, will handle network management functions including the routing of messages between networks as well as within individual networks.

DAP Layer

The Data Access Protocol (DAP) layer of Decnet was designed to tie into the operating system's resources – an "extremely complex" problem, Teichholtz said.

The currently implemented versions of DAP can share files, card readers and printers across nets. DAP can read and write complete remote files using a standard utility called PLE, which stands for Interprocessor File Exchange, Teichholtz said:

Other portions of Decnet already available include the DUP11 synchronous interface which supports the binary synchronous, IBM's Synchronous Data Link Control and DDCMP protocols. It costs $1,375.

The DV11 synchronous/asynchronous preprocessor is available in the aynchronous version with the asynchronous version scheduled for release later this year. An eight-line synchronous version costs $3,410.

The DZ11 asynchronous multiplexer capability will be available this month; an eight-line version will cost $2,100.

Terminal Support Next

Up to now Decnet has not emphasized terminal support, and this will be the next important phase, Teichholtz said. Major enhancements planned are support for multidrop terminal nets, buffered terminals and remote concentrators, he added.

Within two years the architecture will include the capability to do multiplexing through software, he predicted.

DEC may also enter the hardware area with devices that "terminate terminals," but it is not possible to be more specific at this time, Teichholtz said.

User Sophistication Factor

Although there is confusion at present about the compatibility between the communications architecture of various vendors, Teichholtz said the user is too sophisticated to allow himself to be locked into any one network environment.

At present there is no compatibility between Decnet and the X-25 protocol standard recommended by CCITT, but there are nevertheless commonalities at the "functional level" between Decnet, IBM's Systems Network Architecture (SNA) and the X-25 recommendation, he said.

All layered protocols have common header structures for defining sources and destinations of messages and ways of submultiplexing physical channels into virtual channels, he said.

In Decnet, virtual channels are called logical links; in X-25 they are known as virtual circuits and in SNA they are known as sessions.

Despite the difference in terms, each is set up to handle two end objects as if they had a private line between them, he said.

The DEC goal over time is to make the user's program interface to all three protocols "as independent of the link as possible," he said. Eventually users will be able to run application programs using the same constructs with different protocols on each wire, he said.

The overall Decnet goal is to gain transparency for the user, he added.

Despite existing differences between vendors, it is doubtful any fundamentally different network architectures will be introduced in the near future, he said.

CIA Asks FCC to Reject SBS Application

WASHINGTON, D.C. – The Computer Industry Association (CIA) has filed a petition with the Federal Communications Commission (FCC) requesting a rejection of the domestic satellite application of Satellite Business Systems (SBS), a joint venture of IBM, Comsat General and Aetna Life.

The CIA petition claimed the application as submitted and amended by SBS still does not comply with FCC requirements.

In its filing, the CIA noted the SBS application failed to set forth detailed communications and equipment interconnection arrangements as ordered by the FCC. SBS' response regarding interconnection policies and practices was done "only in the most superficial manner," the CIA said.

The SBS application also failed to differentiate between communications interfaces – for which there exist established industry standards – and computer terminal and equipment standards, for which there exist no established standards, the CIA claimed.

"It is this lack of computer interface standards which has contributed to the rash of current antitrust litigations against IBM. Since it is IBM's participation in this venture that has caused the commission to issue the order requiring detailed interconnection arrangement disclosures in the first place, SBS must therefore abide by the commission's order," the CIA said.

Although SBS has admitted most existing terminal equipment will require some modification to effectively use satellite transmission, its failure to specify details gives IBM – the presumable developer of the system – a certain lead-time advantage over other equipment suppliers, according to the CIA.

"SBS' mere promise that interconnection arrangements will be offered through tariffs on nondiscriminatory terms and conditions is of little comfort to manufacturers who realize that interconnection charges for maintaining their equipment on IBM computers may be prohibitively expensive, though they may still be 'nondiscriminatory,'" the CIA told the FCC.

With regard to disclosure of computer interfaces, the CIA said SBS made no effort to provide information on those interfaces other than its general promise to make the system "compatible with as broad a spectrum of terminal equipment as possible."

The petition for rejection further noted that SBS has gone so far as to acknowledge IBM will have an advantage over other equipment manufacturers with regard to the modulation and access techniques the operational system will employ.

"It is imperative that a more specific explanation of access techniques, modulation typea, CPU hardware and software interfaces and tariff estimates be offered by SBS before the application can be approved," the CIA filing said.

In addition to the CIA petition, about nine other companies have filed comments with the FCC. These include Western Union, RCA, AT&T and tbe Department of Justice.

SBS will have an opportunty to respond, after which the other companies can file reply comments. This proceeding should be completed by the end of June, although one of the parties may ask for a time extension.

The FCC Common Carrier Bureau staff will then make a recommendation to the FCC to accept the SBS filing with conditions or set the application for hearing. It is considered unlikely the application will be rejected outright, according to a staff source.

Media III Circuit Board Handles DG Users' Channels

ANAHEIM, Calif. – The Model 2804 from Media III offers Data General (DG) users a line printer controller, real-time clock, four asynchronous communications chanhels and an optional Teletype I/O port (or a fifth communications channel) on one printed circuit board.

Switches in each communications channel allow transmission rate selection in seven steps from 110- to 9,600 bit/sec.

The multiplexer channels are full-duplex, RS-232C standard (20ma current loop may be specified) and compatible with local terminals or Bell 103-type data sets.

The 2804 costs $2,850 and delivery is 30 days from Media III at 2259 Via Burton, Anaheim, Calif. 92086.

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(below) AJ 841, the rugged Selectronic™ printer terminal. A cost effective replacement for the IBM 2741.

(right) AJ 230, a mobile acoustic Teletype terminal. (Also available in auto-answer TWX/DDD versions).
(below) AJ 630, a 30 cps quiet, non-impact printer terminal with 140 character print line. (APL is an option.)

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Sycor Develops NCS for Model 350

ANN ARBOR, Mich. – Sycor has developed a network control system (NCS) for its Model 350 terminal which is said to allow the elimination of front-end processing and CPU support.

Users with large networks of terminals can take advantage of NCS auto-dial software to allow a central Model 350 acting as a master station to control data transmission to and reception from remote 350s without the need for an operator to dial the data set, a company spokesman said.

Once started, the automatic dialing software, operating unattended, is capable of dialing remote, unattended terminals and accomplishing device selection and address checking, he added.

As each communications task is attempted, a log is kept indicating its success or failure; recovery from incidents such as a busy signal can be specified by the operator during initiation of NCS, according to Sycor.

After attempting all specified communications, NCS scans the log for communications tasks which were not properly completed and automatically retries those tasks, the company said.

Designed also to operate as a secondary station in an unattended communications mode, a remote Model 350 can automatically answer an incoming data call and, in response to a control record from either a CPU or a 350 master station terminal, transmit indicated data files or receive data to indicated I/O devices, it added.

The unattended communications software can selectively print received data off-line after the phone line has been disconnected, Sycor said.

The Model 350, acting as a master station, uses 7- or 9-track 556-, 800- or 1,600 bit/in. magnetic tape as a data exchange medium between the terminal and the CPU.

Unattended Model 350 terminals reportedly can be dialed by the master station 350 or under direct CPU control using IBM 2770, 2780, 3770 or 3780 communicatins under Btam, Tcam, Power, Hasp or Grasp set up to transmit the required control record to the unattended terminal.

The NCS is included in the company's latest software release, Level D, for the Model 350.

Level D is available individually at $35 per diskette or in a two-diskette set for $50. It is presently available on the Model 350; NCS will be available Sept. 1 for the Sycor 440 clustered terminal processing system, Sycor said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

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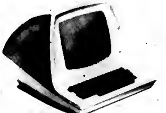

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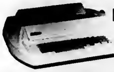

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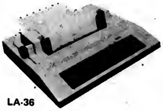

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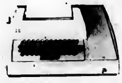

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Adage Has Two Units Which Can Emulate, Replace IBM 2250

BOSTON – Adage, Inc. has introduced the 2250 Model 3 and 2840 Model 2 emulator as a plug-to-plug replacement or addition to IBM 2250/3 interactive graphics configurations.

The Adage 2250/3 is based upon the earlier Adage GP/400 graphics peripheral, which has 300 nsec microprogrammed processor implementing the IBM 2250/3 graphics orders in firmware.

Terminal Transactions

A special GP/400 firmware package reportedly interprets and executes the IBM 2250/3 graphic orders "significantly faster" than the IBM 2250/3. Increased graphics order-processing speed and faster vector drawing speeds are said to allow the Adage 2250/3 user to display more complex screen images, flicker-free at 40 frame/sec.

The GP/400 performs all 2250/3 functions in native IBM 2250/3 graphics orders, the firm said.

The Adage 2840/2 replaces the IBM 2840/2 display control unit and provides for either local or remote (up to three miles) attachment to an IBM 360/370 multiplexer or selector channel.

The Adage 2840/2 contains a 32K-byte image buffer which stores graphic data for the Adage 2250/3 graphics console (up to four consoles may be attached).

Graphic orders from the 360 or 370 are stored directly in the appropriate buffer area and are fetched by the GP/400 for interpretation and execution, Adage said.

The Adage 2250/3 and 2840/2 provide local and remote operation at higher performance and require no IBM software conversion, according to the vendor. Single display console configurations begin at $72,200.

First deliveries are scheduled for August, Adage said from 1079 Commonwealth Ave., Boston, Mass. 02215.

Sweda 1560D Extends Media I/O of LA-36

PINE BROOK, N.J. – Sweda International OEM Products has announced the Roytron Model 1560D which it said expands the media I/O capability of the Digital Equipment Corp. LA-36 terminal.

The Model 1560D includes a photoelectric reader and a Roytron paper tape punch. The latter perforates conventional and special tapes including mylar and mylar composites, Sweda said.

The unit is cable-connected to existing connectors in the DEC printer.

The price of the Model 1560D is $1,995. Delivery is 90 days from Sweda at 34 Maple Ave., Pine Brook, N.J. 07058.

GE Agrees to Supply CRTs Made by Adds for Rentals

HAUPPAUGE, N.Y. – Applied Digital Data Systems, Inc. (Adds) has reached an agreement with General Electric (GE) under which GE will supply Adds CRTs under rental contracts ranging from one month to three years.

All rental contracts will include GE maintenance.

The terminals available from GE will include the Consul 520, 580, 920 and 980 plus the Envoy 620. Adds is at 100 Marcus Blvd., Hauppauge, N.Y. 11787.

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Scanning System Helps Firm Get Messages Straight

NEW YORK – To improve mixed-language communications among Mitsui & Co. (U.S.A.) Inc.'s 185 offices in 77 countries and to and from its customers, the organization is using a computerized message-scanning system at its international headquarters here.

To the American secretaries of Mitsui's Japanese executives and to the operators of the transmitting terminals, Japanese messages that include German, French and code words and are spelled phonetically in English make practically no sense at all.

As a result, errors in typing, on punched paper tape and in transmission of messages were common.

Now a Scan Optics 20-20 optical character recognition (OCR) system, incorporating a Hewlett-Packard (HP) 21MX minicomputer as its system controller, is fed the messages as typed by the executive, reads them at 65 char./sec and stores them on magnetic tape.

When the message is ready to be sent, punched paper tape is automatically produced by the scanner and placed directly into the transmitting machines, eliminating retyping and transmitter operators.

For Mitsui, messages are vital. Each business day, thousands flash electronically through the organization.

The Japanese written on the messages does not utilize Japanese characters, but instead uses the English alphabet spelled phonetically. All Japanese managers and executives have the facility to communicate in this manner.

Most typographical errors, prior to the installation of the scanner, were made by American secretaries because they did not comprehend the language and could not proofread their own work.

These messages would then be picked up several times a day for delivery to the communications room where they would wait, unless urgent, until a special crew of six part-time American transmitter operators would arrive to type the messages again, this time onto paper tape for use in the transmitting terminals.

It took about 22 people to handle the communications volume to and from New York, which amounts to 50,000 messages/mo. With the computerized scanning system, only six persons are necessary.

Biggest Advantage

The biggest advantage of the computerized system, according to William H. Gorham, Mitsui's assistant general manager for general affairs, is that it is less expensive to operate and it eliminates message errors.

"Time and money are saved substantially. Also, message traffic continues to climb, further justifying the use of the automated system," Gorham said.

Another advantage is that since there is less chance for typographical errors, message senders needn't say the same thing several times to avoid a costly misunderstanding.

This has led to more concise messages, saving time and costs of message sending, he noted.

According to Robert L. Brown, an attorney on Mitsui's administrative staff, there are other benefits: "We have reduced the net average time between the first typing of the wires and their actual transmission.

"Also, when individuals in the sales and administrative departments understood their messages would go out originally typed, they became more careful and less verbose."

System Operation

Messages are typed using a standard electric typewriter outfitted with a ball element having the OCR font.

More than 200 messages are placed in the hopper of the Scan Optics system; the start button is pushed, and the pages pass through the scanner.

Up to 60 page/min are processed depending on length and format of messages; up to 65 char./line can be read at the scanning speed of 2,000 char./sec.

After being scanned, the message travels electronically onto magnetic tape where it is temporarily stored. Typically, some 1,600 messages arrive here and 750 of them, ranging in length from a few lines to several pages, are sent out each business day.

With the messages filed on tape, it is possible to automatically perform several types of clerical functions. Messages can be sorted by destination, by sender's name, by originating department, by time, date or by any number of combinations depending on programming.

Global Network

Mitsui's worldwide communications network has more than 250,000 miles of leased lines and handles more than 20,000 message/day.

The network links domestic and foreign offices, subsidiaries and affiliates. Communications via satellite or cable between any two points, regardless of distance, can be accomplished in a few seconds, Mitsui said.

The Mitsui network is configured around three central points, each with a separate large mainframe computer to handle message distribution and switching.

These computers in New York, London and Tokyo interconnect offices in 124 cities around the world. The larger offices are connected by dedicated leased lines, while smaller ones utilize Telex and telegraph networks.

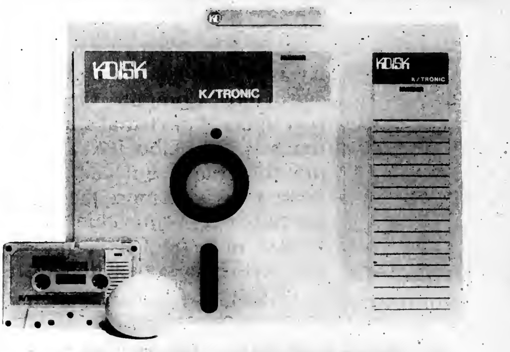
Nine Western Union Telex machines are used for communicating over dial-up lines to Canadian and U.S. customers. Five different makes of communictions terminals permit communications to customers all over the world.

Five additional transmitters are used to communicate within the Mitsui network. These connect to the New York computer, which houses a store-and-forward message-processing system.

The time-shared CPU sends messages via the Tokyo and London computers at 2,400 bit/sec to multiple addresses after checking format and sending error messages if necessary.

Two transmission lines in the communications center here are arranged to receive these error messages, such as those for improper format, from the computer.

A switching patch board connected to a bank of 12 teleprinters is wired for monitoring all communications taking place elswhere in the communications network of the Americas. Twenty-two separate channels, including 10 between the New York and Tokyo computers, can be monitored in this way.



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Write for complete information on the K/Tronic Performance Packages today. Because if someone asks you about our data storage media, you don't want to be caught with egg on your face.

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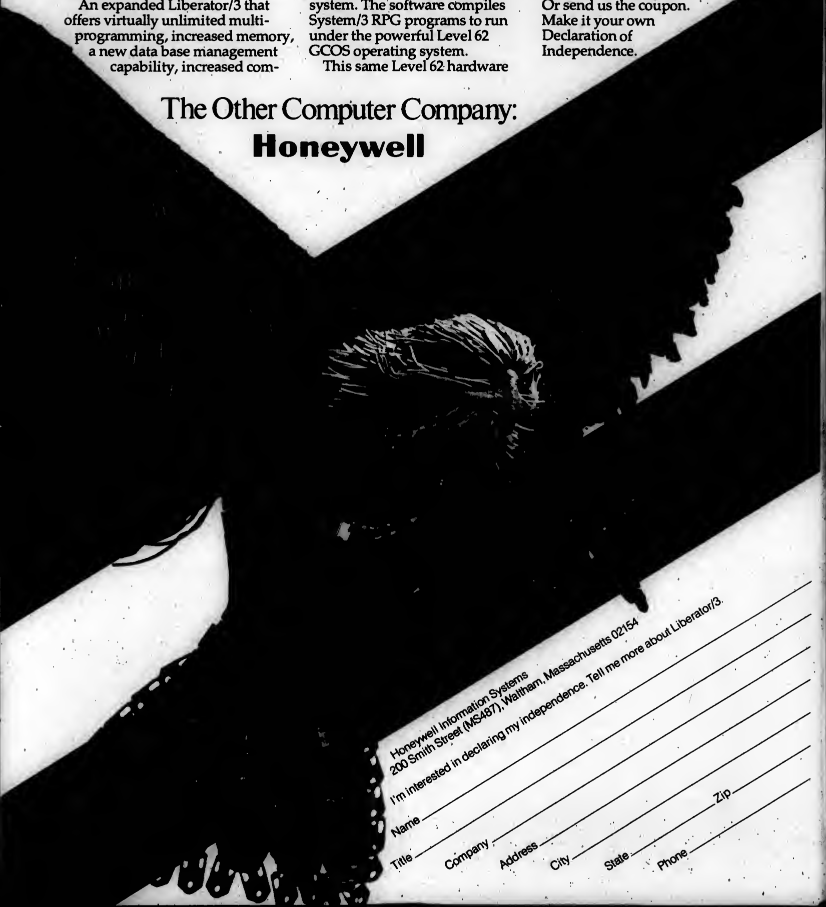

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Organized Around Five Categories

Phased-In MIS Helps NSF Hand Out $700 Million

WASHINGTON, D.C. – The National Science Foundation (NSF) is a small but uncommon U.S. government agency.

Established in 1950 to advance scientific progress by sponsoring scientific research, encouraging and supporting improvements in science education and fostering scientific exchange, the NSF awards some 12,000 grants worth about $700 million each year after evaluating roughly 25,000 proposals.

The computer system at NSF is also uncommon and has an uncommon name – Jason, which is not an acronym but the name of a legendary figure in Greek mythology.

NSF selected the name Jason, a spokesman said, to symbolize dedication, persistence and human interaction on a heroic scale. Jason represents all the hardware and software elements of NSF's management information system (MIS).

It is built on a large-scale, third-generation Honeywell 6060 computer with its Gcos operating system supervisory software and a specially designed subexecutive control element called Hermes, another name from Greek mythology.

Other elements include about 800 application programs, an integrated data base and a network of CRT terminals with slave printer attachments.

Jason was conceived in 1971 when NSF top management decided to design a new information system to meet the agency's needs into the 1980s. Officials envisioned a system that would support all major scientific and administrative operations from the processing of grant proposals to the processing of payroll.

The initial project planning, the requirements analysis phase and the specification writing phase were carried out in 1971 and 1972. Creation of the MIS on-line data base was one of the most complex project tasks – over 400,000 records of various types had to be created by reformatting and loading data from old computer systems and converting manual files, the spokesman said.

In 1974 a comprehensive MIS training program was begun as part of system implementation. Hundreds of employees were trained while NSF offices were eased into the system one by one.

The principal core subsystems were installed by mid-1975 and most parallel operations were suspended as the numerous expected and unexpected start-up problems were solved and the hundreds of modules stabilized.

The result of this intensive four-year program was a comprehensive system employing on-line interaction with the computer over a network of remote CRT terminals and involving an integrated on-line data base currently at about 350 million characters and scheduled to grow to about 500 million in the next 12- to 18 months.

Five System Categories

The MIS is organized around five broad system categories with each subsystem divided into other subsystems corresponding to particular NSF functions or activities.

Although the systems and subsystems are logically independent of each other, data is linked within the integrated data base. Information can be captured only once, at the appropriate point, and is shared by the various subsystems.

The Proposal Processing System supports proposal and application receipt, evaluation, approval, rejection and withdrawal. The focus of this system is on the program director and program manager.

The objective is to relieve administrative burdens while improving decision-making capabilities. The system makes heavy use of on-line capabilities and is composed of four subsystems handling specific responsibilities.

The Program Management System, made up of five subsystems, involves the maintenance of information on active grants and contracts, the creation of project management support records, data collection on government-owned property in the hands of contractors, maintenance of records of grant budgets and the fiscal status of awards and data to support the management of large-scale logistics operations.

The Administrative Operations System is divided into five subsystems to support line management in planning and executing program responsibilities and to provide housekeeping services to NSF organizations. Included are financial accounting, personnel, payroll, mailing list management and equipment inventory administration.

The Planning, Evaluation and Policy Studies System concerns itself with long-range planning, the evaluation of NSF programs and the conduct of studies in support of national science policy planning.

The Local Management System is a supplemental, on-line system providing generalized software to allow users to fulfill unique or one-time information needs that do not warrant inclusion within the main processing subsystems.

Subsystem features include arithmetic and mathematical routines, modeling and forecasting capabilities and software to create and manipulate special-purpose data bases.

On-Line Processing

NSF has adopted the concept that data should be captured at the source by people who know the subject matter best, the spokesman said, noting this is illustrated by the Proposal Processing System.

When proposals are received by NSF, they are processed by a unit called the Central Processing Section (CPS). In addition to handling clerical tasks such as the preparation of proposal folders, CPS captures most basic information about proposals including the title, amount requested, submitting institution and NSF organization and financial codes. This is done on-line in direct interaction with the computer.

CPS employees also check the NSF name file of grant project directors to see if the applicant ever received NSF support. If the applicant has dealt with the NSF previously, the new proposal data is added to his file; if not, a new record is created.

The proposal folder then goes to the responsible program officer. The program officer can use the Reviewer/Panelists Information Subsystem to help select the best scientists to help review the proposed work.

He can also look up the history of the applicant in the Principal Investigator/Project Director Information Subsystem.

(Continued on Page 40)

Data 100 Key-to-Diskette Model Designed for Low-Volume Sites

MINNETONKA, Minn. – Data 100 Corp. has introduced the Model 74-107 Keybatch/Diskette, a key-to-diskette version of its Keybatch data entry system designed for low-volume sites with concurrent data entry and remote batch requirements.

The system, which accommodates one or two local keystations, allows the user to enter, edit, verify and store source data on three diskettes.

The Model 74-107 is compatible with the larger versions of the Keybatch system, allowing the user to upgrade to full Keybatch capability by field replacement of the diskette drives with a cartridge disk drive, the firm said.

Speeds to 4,800 Bit/Sec

Keybatch/Diskette supports 150- to 1,250 char./sec card readers, 125- to 1,250 line/min printers, the firm said, with line speeds up to 4,800 bit/sec achievable in concurrent data entry and communications mode.

Speeds in excess of 4,800 bit/sec are application-dependent, it noted.

A configuration of the Keybatch controller, three diskette drives and adapter, one local keystation and synchronous communications costs $15,456, the firm said from 6110 Blue Circle Drive, Minnetonka, Minn. 55343.

Sycor Upgrades 440, 350 Units

ANN ARBOR, Mich. – Sycor has added 10M characters of fixed-disk storage to its Model 440 clustered terminal used for data entry and added two diskette units to the Model 350 intelligent terminal.

With the addition of fixed-disk storage, the capacity of the 440 system has been doubled from the previous high of 10M characters, Sycor said.

The single platter contains systems programs, user programs and data files in 512-character sectors; spare sectors for backup are automatically assigned and accessed, the firm said.

Seek time track-to-track is 10 msec with a maximum of 100 msec and an average of 70 msec.

A four-station 440 with a 10M-character disk, 64K bytes of memory, cassette interchange and communications leases for $816/mo on a three-year deal and $963/mo on a one-year lease. The purchase price is $29,270.

The additional 10M characters of storage adds $194/mo to the three-year lease and $230/mo to the one-year deal and carries a purchase price tag of $9,000. Deliveries are slated for December.

With the addition of the two diskettes to the Model 350, the unit can now have up to 1M characters of storage, double the previous capacity of the maximum configuration with only two diskette units. The maximum now is four such units, the firm said.

The two Model 350, including two integrated diskettes and 16K bytes of memory, leases for $292/mo on a one-year lease and $253/mo on a two-year lease, both including maintenance.

The dual diskette option adds $125/mo to the one-year lease price and $107/mo to the two-year lease. The purchase price of the option is $4,000.

Deliveries of the diskette units are expected to begin in October, the firm said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Why stick with a single source serial printer?

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DP Dialogue

Notes and observations from IBM which may prove of interest to data processing professionals.

A Helping Hand for Public Assistance in Oklahoma

When a citizen of Oklahoma applies for public assistance with the proper documents, he or she may be in for a pleasant surprise. Even if the application involves multiple services, such as aid to dependent children, medical care or vocational training, a single interview with a caseworker may cover everything, with the appropriate specialist being called for more technical services. The applicant's eligibility for various services can be determined almost immediately and if assistance payments are involved, a check can be issued within 24 hours.

This fast, efficient service is based on the statewide information system of the Oklahoma Department of Institutions, Social and Rehabilitative Services (DISRS). The system operates under the Customer Information Control System (CICS), and links an IBM System/370 Model 158 computer in Oklahoma City to over 250 IBM 3270 visual display terminals. There is at least one terminal in each of Oklahoma's 77 counties. Through a common data base used by all of the public assistance programs, complete and up-to-date information on any case is swiftly accessible through any terminal, reducing the possibility for delay or conflicting data.

As Charles F. McDermott, comptroller of DISRS, points out, the system establishes both eligibility and non-eligibility with equal speed.

"Take aid to dependent children," he says. "Nationally, over 9% of all cases are found to be ineligible. Here in Oklahoma, the ineligible rate is down to 2%—one of the lowest in the nation—due almost entirely to our ability to cross-check through the information system. That reduction alone is saving the taxpayers of Oklahoma about $600,000 a month."

The system also makes it easier to coordinate public assistance grants with employment opportunities and work training programs. This has contributed to another record for Oklahoma—a higher percentage of people on public assistance are getting vocational rehabilitation than in any other state.

Before the information system was installed, a professional caseworker for the Department typically handled about 60 cases. Now, due to the dramatic savings in time and clerical work, a caseworker can oversee as many as 200 cases.

"The caseworker and the client both benefit from the system in improved morale and a greater sense of purpose," says McDermott. "And the individual who foots the bill—the taxpayer—has the satisfaction of knowing that the State's tax dollars are being spent more productively."

Yesterday a blacksmith, today a welder. Dempsey Faulkinberry learned a new skill with the help of Oklahoma's vocational rehabilitation program.

3890 Hits the Trail with Wells Fargo

Between 4 p.m. and 9 p.m. every evening, trucks from 11 regional offices of the Wells Fargo Bank drop off over two million checks and other documents to be sorted and handled at the bank's San Francisco headquarters. All the work must be completed by 11 p.m. the same night.

"Getting the checks from our own 300 branches in Northern California organized, logged and reconciled is a tremendous problem in logistics. Losing time can mean losing a lot of money in the banking business. The faster we can post our own demand deposit accounts and get credit on checks drawn on other banks, the faster we can reduce our float and use the additional money to earn profits," says Watson McKee Jr., senior vice president.

Wells Fargo is the 11th largest commercial bank in the nation.

"Since Wells Fargo began using IBM 3890 Document Processors last December, reconciling time, even on peak days, has been cut by two hours," adds McKee. "Now we can capture and sort over 100,000 magnetic ink encoded documents (MICR) per machine per hour—just about double the speed of our older IBM 2956 processors."

With improvements in multichannel character recognition and an extremely sensitive read head, the 3890 has cut the number of previously "unreadable" documents by 50%. It has helped Wells Fargo to lower its reject rate to 1.3%—less than half the national average for banking.

"Re-sorting rejected checks is traditionally the most expensive aspect of the entire document handling operation because it has to be done manually," explains McKee. "The 3890's will save us a considerable amount of money in that area alone."

Equally important, the 3890 provides a full audit trail for every transaction. After reading the MICR code, the 3890 prints a unique item number on the back of each document. It imprints the bank's endorsement legend on the checks, transmits the MICR code and the item number to one of the bank's two System/370 Model 168 computers. It also makes a microfilm of each document for future reference.

After capturing, numbering and endorsing the documents, the 3890 sorts them according to the bank, branch and type of account to which they belong. In addition to checks, documents such as deposit slips, loan payments, master charge receipts and Christmas Club payments are also processed.

Advanced Features

Among the advanced features of the 3890 are a built-in jogger which automatically aligns the documents and a new document separator which virtually eliminates the "piggy-back" problem—two checks sticking together.

With a total capacity of 36 pockets, available in modules of six pockets, the 3890 can grow to meet the needs of almost any operation. Wells Fargo now has eight 3890's, each equipped with 30 pockets, to handle all the work from its branches in Northern California.

Final conversion to the 3890 was accomplished in a little over two weeks—about a month ahead of schedule. According to Mike Macpherson, group manager in charge of installation, "We did nine months of extensive testing and then gradually added offline applications. Moving to online sorting was virtually transparent to our users."

"We've already realized considerable benefits from the 3890," says McKee. "And as new applications come on, such as cycle sorting, we expect the processor to help us save even more money in the future."

At Wells Fargo Bank, operators work with one of eight IBM 3890 Document Processors. Each machine can read and sort over 2,000 MICR encoded documents a minute.

Advertisement

Teaching the Language of the Deaf with Interactive Computing

Using interactive computing, a student at Golden West College learns the symbol for "drive" in Ameslan, a sign language for the deaf.

A student at Golden West College in Huntington Beach, California, is using a computer terminal to study a picture. The image she is looking at represents the word "drive" in Ameslan, the American Sign Language of the deaf, used throughout North America.

Over 200 students, most of whom have normal hearing but are interested in communicating with the deaf, are enrolled in Golden West's sign language courses which use computer-assisted instruction programs. The programs include 49 separate lessons which introduce 660 signs corresponding to frequently used words or phrases.

"We see interactive computing as a very powerful and integral component of coordinated instructional systems which also include the traditional classroom and other non-traditional learning activities," says Richard L. Mercer, supervisor of computer services at the college. "Using computer-based practice, simulation and other programs, students can add to their knowledge and improve their skills at their own pace and at their own time—almost as if each has a private tutor."

By typing in the English word or phrase at the terminal, the student activates a microfiche file linked to an IBM System/370 Model 155-II at the Coast Community College District's computing facility. A drawing showing how to make the appropriate Ameslan sign for that word flashes on the screen within seconds. The system can also be used in reverse so that the student can test himself.

"We have found student reaction to computer-assisted instruction overwhelmingly positive," says Paul M. Culton, chairman of the impaired hearing program. "It makes learning fun. And it also serves to correct misconceptions on the spot, instead of next week in class."

The college has over 1,000 learning programs in 55 different disciplines ranging from Ameslan to more traditional subjects like history, science and mathematics. All of the programs were developed using A Programming Language(APL). According to Bob Schaulis, director, information services for the Coast Community College District, "We believe that personal computing—giving many people simple access to the full power of the computer—will become increasingly important in many areas of instruction."

North Central Airline Lands $7 Million Saving

As one of North Central Airline's DC-9s lands at midnight in Minneapolis, aircraft mechanics are ready in the hangar with a list of parts to be tested, checked and possibly replaced. Within three or four hours, the necessary inspections and repairs are completed and the plane is in the air again taking passengers to Chicago, Milwaukee, Detroit or any one of the 90 cities served by the regional carrier.

The rapid "mini" overhaul is possible because North Central developed a series of unique computer programs to avoid more costly total overhauls, which can keep a plane grounded for days, instead of hours. Called SCEPTRE—System Computerized for Economical Performance, Tracking, Recording and Evaluation—the programs were developed using structured programming, a technique that required 30% less time than the previous method. They access a data base controlled by IBM's Information Management Systems (IMS) which includes a complete maintenance history of each of the carrier's fleet of 50 DC-9s and Convair 580s.

"We're a regional airline, and our profits really depend on keeping all our planes fully utilized," says John Pennington, SCEPTRE project administrator. "With SCEPTRE, we can schedule maintenance time so effectively, it's like having an extra DC-9 in our fleet. That's a $7 million savings right there."

Information such as aircraft performance history and parts inventory and replacement forecasts is stored on an IBM computer at North Central's corporate headquarters in Minneapolis. Using the SCEPTRE programs, a mechanic, pilot, or executive can check on the maintenance status of any plane from any one of 45 IBM 3277 and 3275 Display Stations located in North Central's hangars, machine shops and parts storage areas. The SCEPTRE files can also be accessed through IBM reservation terminals located in airports throughout North Central's system.

"SCEPTRE helps us spot potential problems long before they occur," says Clive Schuelin, systems manager. "The initial justification of SCEPTRE was based on the expectation that by the time the system is completely operational, it will reduce the existing maintenance budget by 10%. With development well underway, we've already received significant dollar benefits."

Aircraft mechanics service a DC-9 at North Central's maintenance center in Minneapolis. An online IBM computer system helps make the operation faster and more accurate.

Computer Helps Weston "Get It Out The Door" Faster

When you've got 100 highly complex subassemblies in production on any given day, an hour of lost time can mean meeting or missing a shipping deadline. At Weston Components, an affiliate of Schlumberger, Ltd. at Archbald, Pennsylvania, an IBM computer is helping make every hour count by reducing the paper workload and increasing the controls over work in progress.

"We need very accurate knowledge not only of our inventories and purchasing requirements, but also of the exact status of each job," says Mario Dell'Aglio, director of operations. "A great deal of our business is 'job shop' kind of contracts—specialized components made to order. That means we have to figure out new production scheduling, parts requirements and budgets to fit each new assignment."

To help keep track of orders in various stages of completion, Weston uses several IBM programs which run on the company's System/370 Model 115 virtual storage computer. A data base management program creates and maintains basic information files describing product structures and the manufacturing procedures associated with each product.

"We've used the program very successfully to organize our bills of materials—the lists of parts used in each assembly," says Jack Minelli, Weston's systems engineer. "By automatically generating purchase requisitions for each job, it has reduced our clerical work by 30%. Equally important, it allows us to find out how many of the same parts may be needed on several different jobs, thus saving us money through volume buying."

Shop Floor Control is one of several IBM programs used to report on the status of work in progress at Weston Components.

The program insures that up-to-date information relating to costs, parts availability and inventory can be made available to all the departments that may need it. Since data is only entered once for inclusion in a master file, the chances for errors are minimized.

During the past year, Weston computerized another critical aspect of its business—following the progress of a work order at every stage during production. The job is now being done with the help of the IBM Shop Floor Control Program.

"Now we can keep much better track of the manufacturing process and establish priorities for work assignments," says Dell'Aglio. "In addition to getting job status reports daily, instead of weekly, the program helps us identify the total time spent at each work station.

"The system provides for the preprogramming of jobs so that the most efficient work sequence, due dates and priorities are followed."

Both program products aim at the same goal—organizing the manufacturing process so that situations like bottlenecks, material shortages and scheduling conflicts can be spotted and corrected immediately.

"By taking the paperwork burden off our foremen, we can free them for the really important work—planning to optimize the use of our machines and men and avoid costly disruptions of the work flow," says Dell'Aglio. "And the more precisely we know where we stand on work in the shop, the more responsive we can be to our customers' demands."

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

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In Handling Variety of Clients

Upgrade Gives Supplier Improved Service Response

PARSIPPANY, N.J. – Graco, Inc., an international manufacturer and supplier of fluid handling and finishing equipment, has improved its customer service response capability through the installation of a computerized customer order processing and inventory monitoring system.

Installation of this system represents an upgrade of Graco's existing computerized order entry system which has been operational for approximately two years, Graco said.

Six Mohawk Data Sciences Crop. (MDS) 2300 terminals have been added to Graco's computer communications network with the primary objective of reducing the time required for customer order processing.

The MDS 2300s, which have been installed in Graco's U.S. branch facilities, are used for order writing, entry of inventory transactions and the feedback of order status and inventory information for domestic operations. The system stores order information on disk files, then catalogs it for subsequent transmission to and processing by the Minneapolis-based host computer.

Timely Order Processing

"Graco customers like our ability to get their orders into our order processing system the same day we receive them at any of our branch offices, according to Robert Giesen, distribution systems manager at Minneapolis.

"Although we do not stock our entire product line in branch warehouses, we are assured the customer's order for a specific product will be entered on our Minneapolis order-processing system within 12 hours. If the item is in Minneapolis stock, the customer's order will be processed by our master distribution center in Minneapolis the morning after it is received," he said.

"We serve a variety of customers, large and small," Stan Yocum, manager of Graco's information systems, added. "To meet our customer-service objectives, it is imperative that we provide on-the-spot, intelligent order entry capability. One customer order might be for a critical repair part; the next might be from a large Graco industrial distributor or from one of the major U.S. auto plants.

"We have selected the MDS 2300 terminal system to satisfy this wide range of requests on a timely basis," Yocum continued. "Once an order has been received by the host computer, the MDS units provide timely feedback to the local branches on order status at the Minneapolis distribution center right up to the time the order is actually shipped. This approach provides Graco customers the optimum in customer order processing efficiency."

Method Monitors Motor Circuits In DP-Based Plant

TULSA, Okla. – Ford Motor Co. engineers have developed a method for monitoring motor circuits in a computer-controlled plant here.

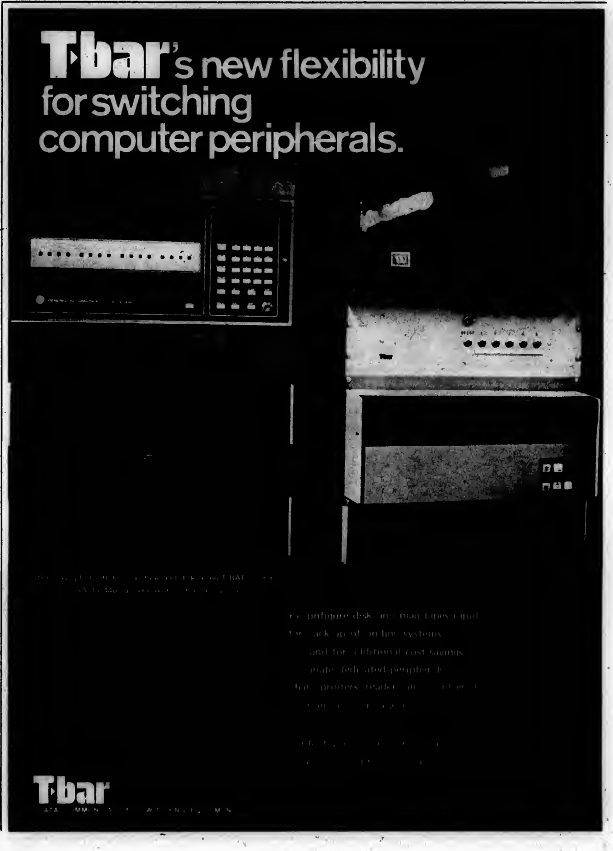
Tied directly into an IBM 1800 computer, a network of electrically isolated current sensors manufactured by American Aerospace Controls, Inc. monitors 164 motor circuits to protect the critical production process.

These sensors were selected by Ford engineers not only because they are electrically isolated from the motor circuits (the current-carrying cables pass through holes in the sensors), but also because the sensor output voltages, in the 0 to 5 Vdc range, are compatible with computer interface circuitry, a spokesman said.

"They permit the computer to monitor the current being drawn by motors throughout this facility so that, in the event any motor should start to malfunction in any way, the resultant increase or decrease in current from the norm would be sensed almost immediately, analyzed by the computer and operating personnel would have ample time to identify and correct the incipient failure," according to R.A. Cushing, Ford supervisor of automation and controls.

The application of current sensing to motors in a manufacturing facility is particularly appropriate because of the variable and critical control requirements which are reflected in motor current variations, Cushing said.

The sensors proved to be the simplest and most practical solution because no excitation voltage is required, connection to the power cable is unnecessary and the dc output signal is directly compatible with computer input circuit, he added.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News Distributor Solves Credit Problem With Systems

E. BRUNSWICK, N.J. – The New Brunswick News Dealer, a distributor of magazines and newspapers here, said it solved a long-standing problem in handling the crediting of magazine "returns" from the retail outlets it services by installing two intelligent distributed data entry systems.

The units have virtually eliminated the errors and uncertainties that plagued the previous method of handling credits for magazine returns, according to Bill McNamara, New Brunswick's general manager.

The problem, he noted is one shared by nearly all magazine distributors throughout the U.S. – that is, how to ensure proper crediting of returns of particular publications by particular dealers and other outlets and the corresponding adjustment of publisher accounts.

Two operators working the Datapoint Corp. Diskette 1100 units handle the entire load of return credits for New Brunswick, which distributes some 45 newspapers and 2,000 magazines. These magazines run the gamut from distinguished news weeklies to comic books and from how-to-books to detective magazines; returns can range as high as 70% for certain categories of books.

Dealers are credited for all returns and publishers reimburse the distributor; it's up to the distributor to make sure that the crediting is handled accurately; McNamara said.

Through master files maintained in disk storage on New Brunswick's IBM 3 computer, information is contained on all 300 dealers and outlets it services and on the magazines sent to each one.

The IBM 3 files are periodically updated by information received from the Diskette 1100 units, which provide reports on the relative efficiency of retail outlets, comparative information on how the various publications are moving in each of these outlets and, concurrently, develop sales histories for order regulation.

Credit Where Credit Due

In handling returns, the important thing is to make sure the credit is given to the right dealer and the proper publication is indicated, McNamara said. Using the keyboard of the Diskette 1100, operators enter the basic information on returns, such as the dealer identification number, the date of return, the "Bipad" number – a unique 5-digit identifying number for each publication, the date of issue and, finally, the quantity of magazines returned. All this information is displayed on the screen.

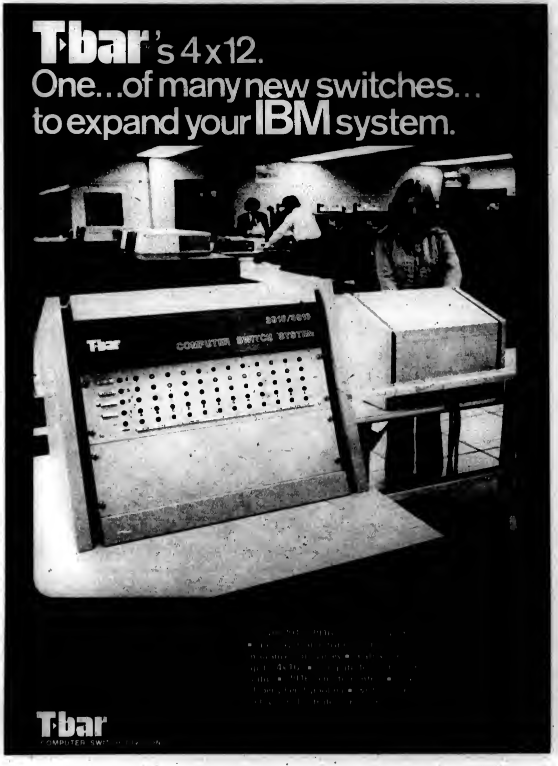
Further, when the dealer number and the Bipad number are displayed, they are accompanied by the actual name of the dealer and the actual name of the publication which the operator can visually scan to make sure he's on the right track.

"Lack of such a visual scan in the past was what complicated the job of handling returns and led to errors and discrepancies in accounts with delaers and publications," McNamara noted. "With the Diskette 1100 units and their display screens, we've eliminated 95% of the problem."

The operator makes a physical count of the returns that are set in boxes near the unit and then enters the data in the appropriate spaces in the format displayed on the screen. Should an invalid dealer number of Bipad number be inadvertently entered, the unit is to lock automatically.

The system is further designed to inform the operator if a magazine is a "premature" return (an active, resalable magazine.) These magazines are not destroyed, but saved and redistributed to retail outlets.

It is important that accurate information on returns be entered at this point, McNamara said, since immediately thereafter the returns are shredded and disposed of (except for prematures) – in other words, the source documents for the data are destroyed.



MIS Eases NSF Work Of Handling Grants

(Continued from Page 36)

Also, any errors in proposal data the program staff finds can be changed on-line immediately.

If the program officer decides to turn down the application, he sends this recommendation to his division director. If the division director concurs, a division employee enters the declination information into the system on-line.

Of fundamental importance to NSF's MIS is the integrated data base concept. In its data base design, NSF employs a modified version of Honeywell's Integrated Data Store (IDS) file organization technique.

In IDS files, data is strung out in chains with records linked together by pointers stored within each record. The use of IDS permits the linkage of related files into a truly integrated data base, the spokesman said.

These chains can be "walked" from different entry points. For example, the same proposal data base can be searched via a "client institution" chain, an "NSF organization" chain or a "field of science classification" chain.

Application programs that access the MIS integrated data base use NSF's Extended Programming Language (XPL). XPL is a modified version of Honeywell's IDS/Cobol language, extended to overcome certain technical limitations of Honeywell's IDS and to support on-line processing capabilities.

The Honeywell 6060 computer system includes a central processor with 384K words of memory, a Datanet 355 front-end network processor, 13 disk drives, 10 tape drives, two line printers, card reader and card punch.

NSF also has an off-line tape-to-print computer printing system capable of printing about 4,000 line/min.

The MIS employs a network of 65 CRT terminals, distributed throughout NSF headquarters and modified for security purposes to permit the transmission of full pages of data rather than one line at a time. About half of the terminals have slave printers attached to them that provide hard-copy printouts of data appearing on the CRT screens.

Data transmission is via Bell 202S dial modems and 202T private line modems at a transmission rate of 1,200 bit/sec over standard voice-greade telephone lines. Acoustical couplers are also available.

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Gcos Release Announced

HIS Extends Memory, Adds Peripherals to Level 62

WALTHAM, Mass. – Honeywell Information Systems (HIS) has announced enhancements to the Series 60 Level 62 minicomputer that include an increase in main memory; additional peripherals; a release of Gcos with extended multiprogramming, data management and communications features; and a Fortran compiler, the firm said.

The enhancements place the 62 somewhere between the IBM 3 and 370, in multiprogramming and communications capabilities, HIS said.

The 4K-bit MOS main memory announced for the system allows the Model 62/40's memory to be increased from 98K to a maximum of 131K bytes, twice that available on the IBM 3/12, Honeywell claimed.

The 262K-byte maximum main memory for the 62/60 doubles the previous maximum, the firm said. The MOS memory will be shipped in the first quarter, it added.

A disk controller with a 1.2M byte/sec transfer rate was also announced for delivery in the third quarter.

An optional scientific instruction set and a standard decimal-to-binary conversion instruction also will be available in the third quarter, HIS said.

Communications capabilities will be improved by "more than doubling" the number of communications lines permitted on either a Model 62/40 or 62/60, HIS said. A second integrated communications controller permitting up to five more lines in addition to the basic four lines and the console line will be available in the third quarter for $48/mo on a five-year lease, or $2,200 if purchased, the firm noted.

Gcos Enhancementa

Multiprogramming capabilities have been extended in a release (RO300) of Level 62 Gcos to allow almost any combination of simultaneous batch and communications jobs concurrent with output writer, HIS said.

Also available in the third quarter, Release 0300 provides for a Fortran language processor; Cobol; RPG; communications; utilities and operator control features; and improvements in resource, data and job management, HIS said.

Dynamic memory management, including compaction of unused space between programs and file-sharing control through tbe job control language, will contribute to Level 62 multiprogramming efficiency, HIS said.

Configuration of cardless systems will be possible under Release 0300, HIS said.

Other data management features include improved sequential file processing and indexed record insertion, the firm said.

A 28K Fortran compiler, a superset of ANS-75 Level 1, will be available for a license fee of $113/mo, HIS said. Enhancements to the Cobol and RPG compilers also will be provided, it noted.

A binary synchronous communications supervisor that operates with either switched or leased lines will permit a Level 62 central processor to communicate directly with an IBM 360 or 370 processor. License to use the binary synchronous communications (BSC) supervisor for connection to host processors will be $131/mo.

However, the maximum monthly charge for using any combination of multiple communications supervisors, including previously announced products for asynchronous and synchronous terminals, remains at $131, HIS said.

Basic utility and sort/merge packages also will be enhanced, the firm said. A communicationa support utility, available at a $10/mo license fee and required for use with the BSC supervisor for processor-to-processor communications, also will be available in the third quarter, HIS said.

A binary synchronous communications supervisor for communication with an IBM 3741 diskette terminal and a 3741 support utility will be available during the first quarter witb Release 0400. License fee for each package will be $10/mo, HIS said.

Peripheral enhancements include a high-speed disk storage module; 300 card/min and 500 card/min, 80-column-card tabletop card readers and addressing features

(Continued on Page 42)

Mini Improves Engineers' Turnaround

By Esther Surden
Of the CW Staff

MINNEAPOLIS, Minn. – A grain engineering firm here is handling data faster and has improved turnaround time with its minicomputer.

T.E. Ibberson Co. has been in the business of constructing grain elevators, feed mills and grain-related facilities since 1881. The firm builds the plants that mix raw grain products with chemicals and minerals to produce cattle feed and poultry feed and operates throughout the U.S., Robert W. Hart, secretary/treasurer for the firm, said.

The company's Burroughs Corp. B700 was installed at tbe firm's headquarters here last January, Hart said.

"We had Burroughs equipment since about 1947 with a succession of various machines and they handled our work very well. In addition, we've had excellent service in the Minneapolis area, and I believe the service factor is very important for a computer," Hart said.

The firm "looked at some demonstrations on IBM," but that was the only other company it considered, Hart said. The Burroughs system was lower in price as well, be noted.

Prior to the installation of the B700, Ibberson was using two Burroughs E6000 systems, which Burroughs describes as a marriage between the electronic accounting machine and the computer. The models at the company had punched card I/O and a magnetic stripe ledger card option, Hart said.

The B700 configuration at Ibberson today includes a 32K processor, two 2.4M-byte disk drives, a line printer and system console. It cost "in excess of $50,000," Hart said.

Several Applications

The firm is running a number of applications on the system. Programming was developed by a local software firm. "We directed them rather closely," Hart said.

Payroll is one of the most complicated applications on the B700, he said. The system keeps track of between 180 and 200 employees scattered in about 10 states and computes all the various state taxes that must be withheld.

During some pay periods some employees may work in more than one state, further complicating the payroll problem.

Cost Distribution Syatem

Accounts receivable, accounts payable and employee history files are all on the system. Tbe firm calculates an insurance premium from the job cost distribution application and distributes both material and labor costs according to a specially devised code system. The cost distribution system is current within four days after the work week closes, Hart said.

Tbe company also generates the monthly Workman's Compensation and public liability premiums from the system.

An equipment reporting system, in effect an inventory and costing device, allows the company to determine the cost of its used quipment and relate it to the job cost, he said.

A sophisticated job analysis gives the progress of each job at any given point in time, Hart noted.

"Certainly speed was one of the major factors that caused us to make the switch in the first place, and it's bearing out," Hart concluded. The firm is pleased with the faster turnaround time and faster handling of data available with the B700. The faster handling of additional data that we couldn't generate from our E6000" was another benefit, he said.

Prime Has Memory, Disk Subsystem

NEW YORK – Prime Computer, Inc. announced both a 256K-byte MOS memory board and a 300M-byte disk subsystem for its 400 CPU at the National Computer Conference here last week.

The memory board is based on 16K-bit memory chips and offers a capacity four times greater than Prime's 64K-byte memory board using 4K chips, the firm said.

The memory features a standard error-correcting code (ECC) whicb adds a special 5-bit code to all data stored in memory. Used in conjunction with checking firmware, the code automatically detects and corrects all single-bit errors without interrupting CPU activity, the firm said.

The code corrects most multiple-bit errors as well, Prime said.

The memory board costs $35,000 with initial dellveries determined on a "system-by-system basis" until the chips are available in sufficient quantities from Intel, the major supplier, the firm said.

The 300M-byte disk subsystem includes a disk drive, 12-platter removable disk pack and controller. Up to three more drives can be added to the subsystem for a maximum capacity per controller of 1.2G bytes, Prime

The Primos operating system supports two controllers for a combined maximum on-line disk capacity of 2.4G, the firm noted.

An error-correction feature for the subsystem is implemented via a combination of hardware and system software, Prime said. The feature allows automatic correction of up to 11 bits in any one burst error, the firm said.

The disk plus controller costs $49,000. Additional disk drives cost $41,000 each. Deliveries will take place in the first quarter. Prime is at 145 Pennsylvania Ave., Framingham, Mass. 01701.

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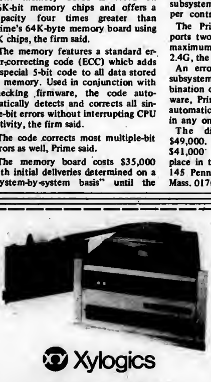

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Also Used to Educate

Mini Performs Administrative Functions at College

By Esther Surden
Of the CW Staff

SANTA ROSA, Calif. – The minicomputer in the data processing department of Santa Rosa Junior College here performs both the administrative and educational functions for the school, according to Paul Petersen, director of data processing for the school.

The Hewlett-Packard (HP) 3000 system was purchased as an upgrade to an IBM 360/20 which, while it supported the administrative efforts, "wasn't very good for the students," Joseph Waters, a data processing instructor at the school, said.

The school considered adding a faster card reader to upgrade the system, but the 20 wouldn't support it, and the college would have had to go with a larger CPU.

It then considered Honeywell machines and the IBM 360/30 and 360/135. During this time, some of the instructors decided it would be nice to have a system that would support both time-sharing and batch. At that time HP announced the 3000, Waters said.

The people who were evaluating systems liked the HP 3000 specifications right away, but had heard "horror stories about how it crashed" every five minutes and decided at first not to obtain it.

Santa Rosa then considered the possibility of getting dual systems, one for the administration and one for the students. During this time the school evaluated the whole cross-section of what was available, Waters said.

HP then came back into the picture because by this time the bugs were worked out of the 3000 system, Waters said, and "I chose to reconsider."

Formal bids went out with two kinds of specifications listed, one for a combined time-sharing-batch system and another for separate systems. IBM did not bid; Honeywell bid but was too expensive, Waters said.

The system was bought on a one-year lease and, at the end of the lease, the college had the option to purchase or return the system. It cost in excess of $200,000, Waters said.

Conversion to the 3000 from the IBM system was simpler than expected, Waters said, and, after the year, a committee to evaluate the system recommended the college keep the system.

The configuration at the college includes a CPU with 128K bytes of memory, two disks with 47M bytes each, an HP 4905 swapping disk, one 7-track 800 bit/in. tape drive, a 600 line/min printer, a 200 line/min printer, two 600 card/min readers, a system console and a 16-port multiplexer for time-sharing, Waters said.

The college also has a "mixed bag" of other terminals, including Digital Equipment Corp. Decwriters.

The biggest problem is the system really needs more memory to be effective, Waters said, but HP has said more memory will be available for the system soon, he added. "We've grown far more rapidly than we anticipated," he said.

The system is used by the math and chemistry departments for instructional purposes. The math department uses it for working in Fortran.

In the chemistry department a student may be issued an unknown quantity with the record of what it is kept in a file on the system. As the student works out his problem, the system will give back the correct answer.

Also the computer can generate a hypothetical situation with random values for the student to work through.

In addition, an excess of 300 people enrolled in data processing courses have access to the machine, Waters said. Scheduling is open ended, with no formal lab periods, and this so far has worked very well, he continued.

Most of the administrative functions carried out on the mini come from the registrar's office, Waters said. These include the registration of students, the add/drop procedure and a census which is taken somewhere in the middle of the term. The census is a report to the student of his status in a particular class and allows a professor to drop a student who has never shown up for class.

State and federal reports and reports of program budgeting are also produced by the system, Waters said.

Memory, Peripherals, Added to Level 62

(Continued from Page 41)

that allow attachment of some previously announced Series 60 devices to the models 62/40 and 62/60, HIS said.

An 80M-byte mass storage unit, the MSU0330, uses a high-speed disk controller to increase the I/O transfer rate from 312 kbyte/sec (with the MSU-310) to a maximum of 1.2M byte/sec. It also increases the maximum Level 62 system transfer rate from 837 kbyte/sec to 1.6M byte/sec, HIS claimed.

Up to two disk units, or a maximum of 160M bytes, can be attached to any 4K MOS memory 62/40, the firm said. Up to six units, or 480M bytes, may be configured with a 62/60 HIS said.

The MSU0330 mass storage unit will be available in the third quarter for a monthly rental fee of $386 on a five-year contract or for $15,700 per unit, it noted.

The 80-column-card tabletop card readers that operate at 300 card/min or 500 card/min will be available in the fourth quarter. The 300 card/min version can be rented on a five-year contract for $162/mo or purchased for $4,305.

The units can be upgraded at the customer site to 500 card/min readers which can be leased on a five-year contract for $205 or purchased for $7,560. HIS or IBM-mode operational mark sense features may be rented for $117 on a five-year contract or purchased for $4,305, HIS said.

In addition, the 1,200 line/min and 1,600 line/min printers previously available on Level 64 and 66 systems will be available in the second quarter for the 62/60. HIS is at Waltham, Mass. 02150.

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Total Automation Planned

Denver Mini Monitors Movements in Water System

DENVER – Minicomputers in this mile-high city are helping to solve Denver's unusual water problems.

Lacking a major water supply, the city not only faces conservation of a sparse 13 inches of annual rainfall, but copes with a singular distribution situation.

Every day, 500 million gallons of water plummet down the steep slopes of the Rockies through 1,700 miles of conduits and mains to Denver homes and businesses. Pressure must be delicately balanced to avoid too much pressure in some lower areas and too little in hillside neighborhoods.

Using minicomputers, the Denver Water Board is taking gradual steps toward total automation that will eventually regulate water flow, measure purity and schedule filter bed flushing.

The board's first step was installation of a Digital Equipment Corp. PDP-11/45 RSX-11D system to monitor the water depth in 11 mountain reservoirs, the rate of flow from the reservoirs through conduits ranging in size from 2- to 90 inches in and out of four filter plants and the pressure exerted at 39 pump stations.

Monitoring Consolidated

Monitoring, once done in four chartrooms at various locations, is now consolidated in a single room so one operator can determine the status of every part of the system using one terminal.

From this room, the operator can request the present status – updated every 60 sec – of any element of the system or minute-by-minute performance for the previous two hours.

Data at 15-min intervals for the previous 48 hours also remains on-line so enough information is available for the operator to decide whether valves should be opened or shut off.

The water system has room to store 250 million gallons of treated water. The remaining 250 million gallons is treated on the same day it is used, so the system works most of the time at full capacity with 50,000 tons of water moving through the pipes at any one time.

In the summer, Denver residents use 80% of their water for lawn irrigation. This means a sudden localized rain storm dumping lots of water on an area can result in a shutoff of sprinkler systems that could produce pressure buildups and ruptures along the system unless valves are adjusted quickly but gradually, the user said.

To accomplish this automatically, the Denver Water Board has developed a computer model of the system. The board plans to put historical demand data and weather information on-line so the computer can predict water usage.

By doing so, the board hopes to minimize the need for pumping to the point that savings in electricity will pay for the computer hardware. The board also anticipates this regulated flow will reduce maintenance costs because there will be less wear and tear on pipes and fittings.

While the first PDP-11/45 is regulating water distribution, a second RSX-11D system is being phased in to monitor the purification process at the filter plants. In the future, computers will control the rate of flow of raw water in treatment plants, test the water for clarity, direct it to a filter bed and test it for fluoride, chlorine and PH content to see which chemical must be adjusted.

The first 11/45 system supports eight terminals and has 96K of memory, disk, a line printer and magnetic tape. The mini being phased in has 56K of memory, magnetic tape and two disk drives and supports a CRT and two printers, according to Philip Richardson of the water board.

The total equipment cost was about $400,000, he said.

DEC Word Processor Built Around PDP-8/A

MAYNARD, Mass. – The WS-100 is Digital Equipment Corp.'s latest offering in its word-processing line.

The system was designed for users who do not require data processing in the same system as word processing, DEC said.

Built around DEC's PDP-8A mini, the WS-100 has a CRT for text editing and a letter-quality printer that can operate at up to 540 word/min. More than 100 pages of text can be stored on one floppy, the vendor said.

The WS-100 costs $19,800. An asynchronous Ascii communications line interface which permits the system to communicate with other systems is available for $1,500. DEC is in Maynard, Mass. 01754.

announcing
1976 minicomputer–microprocessor market survey

The results of the fifth annual market survey among buyers of minicomputers, microprocessors and miniperipherals are now available in a special 80-page report.

The report features over 60 cross tabulations showing share-of-market statistics for all major vendors of minicomputers, microprocessors, microcomputers and miniperipherals.

The survey participants reported having 39,000 minis in place as of January 1, 1976 – accounting for nearly 30% of the total installed base of minicomputers in North America.

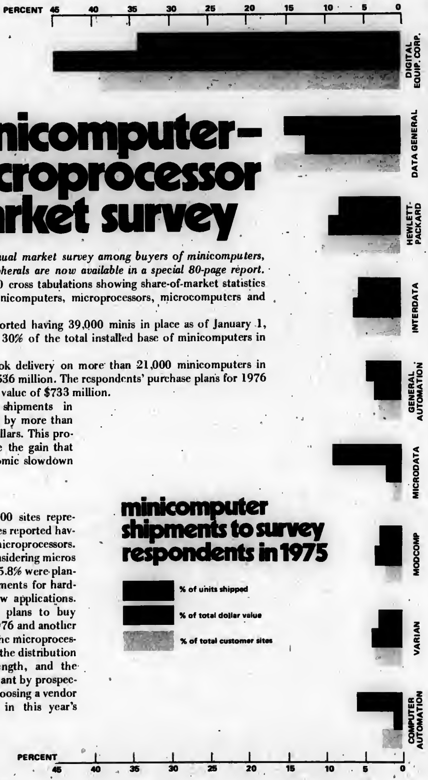
The survey respondents took delivery on more than 21,000 minicomputers in 1975 at a reported value of $536 million. The respondents' purchase plans for 1976 include 28,000 minis at a total value of $733 million.

Worldwide minicomputer shipments in 1976 are projected to increase by more than 30% in terms of units and dollars. This projected growth is nearly double the gain that was achieved during the economic slowdown of 1975.

MICROPROCESSORS

Nearly one-half of the 5,700 sites represented among the survey replies reported having an active interest in microprocessors. About 8.3% of these were considering micros as substitutes for minis while 35.8% were planning to use micros as replacements for hardwired logic or for entirely new applications.

The respondents reported plans to buy 362,000 microprocessors in 1976 and another 576,000 (up 59%) in 1977. The microprocessor vendors being considered, the distribution by application and word length, and the factors considered most important by prospective buyers of micros when choosing a vendor are tabulated and analyzed in this year's survey report.



minicomputer shipments to survey respondents in 1975

Micro Products

Processors, Memories Among 19 Offerings From NEC

LEXINGTON, Mass. – NEC Microcomputers, Inc. has expanded its line of microcomputer products with two Intel 8080A-type CPUs, seven memory products, two controllers and eight support chips.

The processors are the UPD8080A-2, a 2.5-mHz device, and the UPD8080A-1, a 3-mHz device.

The memory products include the UPD458D, a 28-pin electrically erasable programmable read-only memory (Eprom) organized 1K- by 8 bits with a 450 nsec maximum access time.

The random-access memories (RAM) announced included the UPD2102ALC family of 16-pin 1K- by 1-bit static NMOS units with separate data I/O and access times of 250-, 350- and 450 nsec and the UPD2101ALC family of 22-pin 256- by 4-bit static NMOS devices with separate data/I/O and access times of 250-, 350- and 450 nsecs, pin compatible with UPD5101C-E CMOS RAM.

NEC added the UPD2111ALC family of 18-pin 256- by 4-bit static NMOS devices with common data I/O and access times of 250-, 350- and 450 nsec and the UPD5101C-E, a 22-pin 256- by 4-bit static CMOS device with separate data I/O and access time of 1,000 nsec.

The controllers include the UPD371D, an 8-bit bus-compatible controller which handles up to two magnetic tape cassette drives in an 8080A microcomputer system and the UPD372D, a flexible disk controller that is compatible with IBM 3740 flexible disk drives and controls up to four drive units in an 8080A microcomputer system, the company said.

The support chips announced the UPB8224D, a 16-pin single-chip clock generator and driver; the UPB8228D/38D, a 24-pin system controller and bus driver; and the UPD8251C, a 28-pin universal synchronous/asynchronous receiver-transmitter.

In addition, the company has the UPD8255C, a 40-pin programmable parallel I/O port; the UPB8214D, a 24-pin priority interrupt control unit; the UPB8212D, an 8-bit I/O port; and the UPB8216D, a 4-bit bidirectional bus driver.

Price of the UPD8080A-2 processor is $27.30 and the UPD8080A-1 sells for $35.

The NEC Eprom is scheduled for delivery in the third quarter and has not yet been priced.

The UPD2102ALC with 250 nsec access time sells for $5.20; the 350 nsec model for $4.60 and the 450 nsec model for $3.25.

The UPD5101C-E CMOS RAM is $9.35. The other two, as well as the controllers, are scheduled for delivery in the third quarter and have not yet been priced.

The UPB8212D I/O port costs $4.12 and the UPB8216D is $2.88.

The other support chips also will be priced sometime close to their third quarter delivery date.

All prices are for 100-unit quantities, NEC said from 5 Militia Drive, Lexington, Mass. 02173.

System From ETC Based on 6502

HAWTHORNE, Calif. – Electronic Tool Co. (ETC) has a microcomputer system, based on the MOS Technology 6502, which is intended for system development, control and small-scale data processing applications, the firm said.

The ETC-1000 comes with a 40-key keyboard, programmable 8-digit display, I/O interfaces, power supply and memory, the firm said.

The keyboard for control and data entry includes a full set of data entry keys as well as system function keys.

The ETC-1000 has a direct I/O system with eight latched output lines and eight latched input lines which can, under program control, operate external devices. A two-level hardware interrupt system is standard, ETC added.

The CPU includes the 6502, clocks, control logic, interface buffers, 1K of random access memory and 256 bytes of read-only memory containing system control functions, the firm said.

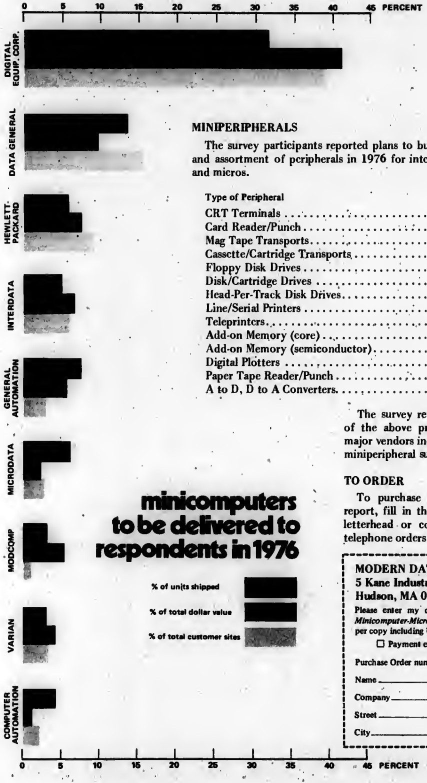
A complete system costs $675. ETC is at 4736 W. El Segundo Blvd., Hawthrone, Calif. 90250.

Firmware for 8080 Available From REI

VAN NUYS, Calif. – Recognition Systems, Inc. (REI) has high-speed, floating-point firmware for the Intel 8080 microprocessor, the vendor said.

With 16-bit mantissa and seven-bit characteristic, numbers from 10^{-9} to 10^{+9} can be represented with 16-bit accuracy, REI claimed.

Called Missy, the firmware costs $495 including programmable read-only memory. REI is at 15531 Cabrito Road, Van Nuys, Calif. 91406.



MINIPERIPHERALS

The survey participants reported plans to buy an unprecedented quantity and assortment of peripherals in 1976 for interconnection with their minis and micros.

Type of Peripheral	Qty to be Purchased By Survey Participants
CRT Terminals	45,558
Card Reader/Punch	2,067
Mag Tape Transports	10,276
Cassette/Cartridge Transports	4,257
Floppy Disk Drives	9,909
Disk/Cartridge Drives	13,285
Head-Per-Track Disk Drives	3,033
Line/Serial Printers	12,357
Teleprinters	18,466
Add-on Memory (core)	7,412
Add-on Memory (semiconductor)	2,650
Digital Plotters	809
Paper Tape Reader/Punch	3,659
A to D, D to A Converters	7,413

The survey report charts the percent share of the above prospective orders for all the major vendors including over 100 independent miniperipheral suppliers.

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William Taylor reads diagrams for Univac mark/read keypunch.

Completing setup ahead of schedule at Harris Corp. called for a game of cards between Larry Vest and Judy Thedford.

CW Photos by M. Upton

Chuck Rhinehart, IBM field engineer, works on IBM 3270 control unit.

Room for All Seen

Mini Firms Greet Mainframers in Small Business Area

By Toni Wiseman
Of the CW Staff

NEW YORK – Increased small business systems offerings by major mainframe manufacturers have not had a large impact on the sales of minicomputer manufacturers, according to a number of company representatives interviewed at NCC here last week.

In fact, the mini makers were unanimously pleased that IBM and other mainframers had decided to enter the market, thus making it "legitimate" in the eyes of users.

"There has always been formidable competition in the small business systems area, but we have our own customer base and the market is big enough for everyone to share," Harlan Dybdahl, head of marketing for Modular Computer Systems, Inc. (Modcomp), said.

"Everyone is offering something different – more or less power, faster throughput, etc. – so I don't see any problems, at least for us, over the next three to four years," he said. "IBM's entry has had the net effect of opening up the market, and there's always enough spillover for the rest of us."

Modcomp's business is about 60% OEM and large-volume end-user, with the Modcomp IV currently its most popular product, he said. He expects continued sales growth for the system in the telecommunications area as a result of multiterminal access and data base usage.

Modcomp has recently acquired ECS, a software company specializing in small business applications. As a subsidiary, renamed Modular Business Systems (MBS), it will do turnkey-type work for Modcomp systems, Dybdahl said.

Ben Holmes, Computer Systems Group marketing manager for Hewlett-Packard Co. (HP), agreed IBM's entry into the small business systems area will be good for HP, since this would undoubtedly expand the market.

HP should do well in the market, he said, since, "if you left HP to its own devices, with no IBM out there, we would have a tendency to be a full-service company, very end-user directed."

Holmes has not seen any change in order patterns, "though the trend toward more end-user business is there." There has been an upturn in OEM orders recently, however, which he attributed to that market's recent economic recovery. He did not expect it to be a long-range market trend, however.

"The minicomputer industry is more legitimate today in the eyes of most customers; it's not a funny little thing any more," Holmes said. "The industry is maturing and breaking into tiers."

"Competition is good. It give end users the benefit of the latest technological innovations in the industry," Ron Doiron, Microdata Corp's Reality product manager, said.

Welcomes Mainframers

Doiron welcomed mainframe manufacturers into the market, noting that, while IBM gives the market credibility, it can't afford to offer the end user the services Microdata and its dealerships can.

The small business systems market will grow to the point where, in 1980, after IBM takes it 35% to 50% share of the market, there will still be enough business to make 14 or 15 minicomputer manufacturers $100 million/year companies, he predicted.

Larry Meredith, General Automation, Inc. (GA) marketing manager for data management sytems, said: "Sure we're feeling it," referring to IBM's entry into the market, "but it's not impacting us from a revenue standpoint.

"The mainframe manufacturers are spreading the word. And we get a certain percentage of every ad they run and every sales call they make. So their entry can do nothing but help us," he said. Most GA systems are sold to OEMs, and the number of OEMs is increasing satisfactorily, he said.

GA's most popular product is the DM 130/2, at the low end of the DM 100 series, he said. Its popularity is largely because of its price. It is also the only system sold as a package, with a fixed set of peripherals including a 10M-byte disk drive, two CRTs and a 165 char./sec printer, he said.

Meredith predicted GA's orders will increase for low-end systems, as the firm

(Continued on Page 48)

CRT, Disk Drive Vendors Praise Order Upswing

By Molly Upton
Of the CW Staff

NEW YORK – "Fantastic," "super" and "excellent" were some of the descriptions given by vendors of CRTs and disk drives when asked how business is compared with six months ago.

Business is "super" and growing at 40% a year at Beehive Terminals, according to Duke De Forest, vice-president of sales engineering.

John A. Hill, vice-president of sales for Megadata Corp., observed business is on a "definite upturn," while Richard Kaufman, director of marketing for Applied Digital Data Systems, Inc., said he has seen a tremendous upsurge in activity across the board.

The CRT business has "picked up in tempo," and "is getting better all the time," according to Lear Siegler, Inc.'s Bill Terry, national sales manager.

TEC, Inc.'s Bruce Hamilton said the firm's business is up about 30% over a year ago and 20% over six months ago.

Delta Data Systems, Inc. has been experiencing a lot of new business, partly because of new products in the intelligent terminal area, according to Gary Bard, Delta Data Systems, Inc.

Business is "excellent," up 20% over six months ago, Andy Mathews, national sales manager at Hazeltine Corp., said.

Calcomp Graphics Growing

California Computer Products, Inc.'s (Calcomp) – OEM disk drive business is definitely up and the graphics area continues to grow at a reasonable rate, considering graphics tend to suffer in a bad economy, according to Paul F. Seckendorf, president of product marketing.

Ray Crowder, Control Data Corp.'s product sales manager for disks, said business is "fantastic," definitely better than six months ago.

At Diva Corp., business has grown threefold in the past six months, according to Gary Beebower. He attributed the rise to both changes in the marketing structure and new disk products.

Business 'Booming'

Memorex Corp.'s Bob Booth, sales promotion manager, said business is "booming," stronger by about 50% than six months ago.

David Ophir, president of Ontel Corp., maker of intelligent CRTs, said business is very good since the firm started its marketing effort, and it has picked up overseas.

However, since the firm is essentially still phasing in production, comparisons with the past are virtually meaningless, he said.

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Sometimes technicians become furniture movers.

CW Photos by M. Upton

John Sokol of an audiovisual firm takes a break while setting up the Univac booth.

Mini Firms Expect Upward Trend To Continue for Next Six Months

By Toni Wiseman
Of the CW Staff

NEW YORK – Business has been on an upward swing for mini manufacturers for the last six months, and they expect to continue in the same pattern for at least the next six, according to several companies interviewed at NCC here last week.

Orders have been up substantially in the last six months, according to Ben Holmes, Hewlett-Packard Co.'s Computer Systems Group marketing manager, and the company expects business to get even better.

"We've got three good new products, and I think in the minicomputer industry a firm's orders are a function of new products," he said.

Harlan Dybdahl, head of marketing at Modular Computer Systems, Inc. (Modcomp), agreed with Holmes' optimistic outlook, noting sales in the last year had reached $38 million. He projected growth to $52 million for this year, based on the upward trend of the last six months.

The order rate for all product lines is picking up at General Automation, Inc., according to Larry Meredith, data management systems marketing manager. Sales have been particularly strong in the last two or three months, he said, "and the curve is getting even sharper."

At Prime Computer, Inc., first-quarter sales were up 78% as compared with the year-ago period, according to Gabe d'Annunzio.

Prime expects the trend to continue at the same rate for some time, he said.

Prime is concentrating on large end users who are interested in decentralizing, rather than on small first-time users.

Data General Corp. (DG) is currently shipping more systems to OEMs than to end users, Don McDougall, international marketing manager, said. The ratio is about 60% to OEMs and 40% to end users.

"The whole industry is shipping more to OEMs now because they let their inventories run down during the recession and they are now replenishing," he said.

CRT Makers Cite Price Cutting In Semi-Intelligent Terminals

By Molly Upton
Of the CW Staff

NEW YORK – The price war so prevalent in the glass Teletype replacement field of CRTs two years ago has migrated to where the current action is – in the semi-intelligent CRT field, according to several makers exhibiting here at NCC.

"There is a definite price war among the semi-intelligent CRTs," according to Bill Terry, national sales manager of Lear Siegler, Inc. (LSI).

This pricing situation should bottom out by the end of the year or spring, he said.

While not all those interviewed acknowledged the existence of price cutting per se, there was unanimous agreement the microprocessor has had the most significan impact on the CRT marketplace.

An increasing number of firms are adding semi-intelligent models in their line. partially because such products offer higher margins than the glass Teletypes and partially because of market demand.

Although all agreed there are various ways of defining intelligence, for the purposes of these interviews a semi-intelligent terminal was defined as having editing capabilities, but not begin user-programmable.

Shakeout Occurring

Duke De Forest, vice-president of marketing for Beehive Terminals, and John A. Hill, vice-president of sales for Megadata Corp., saw a shakeout occurring as makers only of dumb CRTs tend toward broader product lines.

De Forest estimated a CRT maker whose sole line was dumb CRTs would have a lifetime of one year if it didn't offer more breadth in its line.

Richard Kaufman, director of marketing for Applied Digital Data Systems, Inc. (Adds) said the shakeout has already happened in a way. Companies are still around, but are not maintaining their market share, he said.

For example, the market is growing at 40% to 50%, and Adds has grown from $2 million a few years ago to $18 million while others have grown from $2 million to $8 million, he said.

Bill Terry

Kaufman was less emphatic about price cutting, saying the industry has matured so he doesn't see any drastic 30% to 40% cuts as there were in the past. However, it's a "highly competitive field," he said.

TEC, Inc.'s Bruce Hamilton said he hasn't seen a lot of price cutting, but he has seen different ways of pricing.

Andy Mathews, national sales manager of Hazeltine Corp., said pricing cutting has just about bottomed out. As technol-

(Continued on Page 48)

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This was the finding of a recent study by the U.S. Department of Commerce, published in *Export Market Digest.* And the U.S. Dept. of Commerce is an excellent source of information on marketing prospects in Japan. In summary, they report that:

1. Japan will continue to increase imports of foreign-manufactured EDP equipment at the rate of 30% per year through 1977. In 1977, total Japanese DP imports will exceed $1 billion per year.
2. The U.S. share of the Japanese import market is 55%. This should remain constant, although in previous years the U.S. share has reached as high as 70%.
3. Minicomputer sales in Japan are expected to chart a phenomenal 60% annual growth rate through 1977.
4. Independent peripheral equipment purchases are expected to rise 44% in this period.

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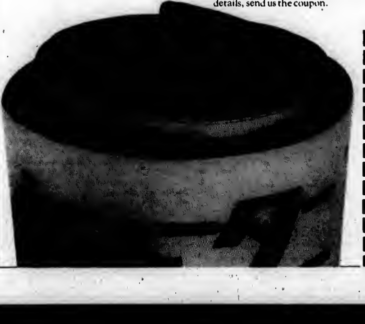

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Mini Makers Greet Mainframers; Expansion Cited

(Continued from Page 46)

makes the system more flexible by adding more capability.

Small business systems as a part of networks are becoming a large portion of its business, he said, so GA is expanding the communications capabilities of the DM 100 series, allowing the systems to emulate remote job entry functions, for example.

While the company is in a period of stability with the DM 100, with no major new thrusts anticipated, over the next six to 12 months there will be an effort to incorporate the new Solution series hardware into the DM 100 series, for cost and performance reasons, Meredith said. Solution series hardware is microcomputer-based.

"The Solution hardware is hotter stuff than the DM 100," he said, "and we don't want to be in the forefront of this market.

"Our first-time users don't care what the hardware is as long as it works, but there will be big benefits in terms of price, as well as better performance and more capability, with the micro hardware, and we can pass this on to the user."

"There will always be two types of companies in the small business systems area," according to David S. Greenberg of Mini-Computer Systems (MCS). "First there are the IBMs, which have the money for marketing, and the companies which try to emulate the IBMs. The other type of company is the one which will stay at the personal level, like MCS."

Always a Need

"There will always be a need for us," he said, "just as there is a need for the Mom and Pop corner store even though there may be an A&P or Kroger's right next door.

"Prices may be a little higher, but the Mom and Pop operation does that little bit extra to get the business. That's where we come in," he said.

Greenberg predicted most business will grow as the company gets into application software in the next six months, mainly through systems houses.

Don McDougall, international marketing manager for Data General Corp. (DG) said DG is aiming for the market between the IBM 370 users and the IBM 3, System 32 and similar systems users. This user is either a 370 user who wants to decentralize or a small business system user who wants to upgrade, he said.

This middle-area user typically is a sophisticated user who wants data base, compatibility and real-time capability, McDougall said.

McDougall predicted that micros, such as DG's recently introduced Micro Nova, will become very important in the small business systems area, as there is not much call for large peripherals in these configurations.

Prime Computer, Inc.'s business hinges on the Create Series, Gabe d'Annunzio said. But by early fall the company expects to announce the Transact Series, a business system based on the Create philosophy.

The Create Series is a group of packaged hardware/software configurations, each designed to provide a different level of performance for interactive computation and time-sharing, he said.

The Transact Series, d'Annunzio predicted, will be a packaged starter system consisting of the hardware configuration and operating system. "Basically, everything one needs to plug in one's own application software," he said, noting that its target market is the large user who wants to decentralize.

Interdata, Inc. is just getting into what might be considered the small business systems area, depending on how that market is defined, according to President Dan Sinnott.

The company currently has a product management team working strictly on commercial business systems, he said, "but we've been atypical in this area in that we've waited to get into it until we knew our software and hardware was proven."

The support requirement with the business systems users is going to be much higher than minicomputer manufacturers are used to. "The users expect much more hand holding than we're used to; they aren't box-oriented," Sinnot said.

Four-Phase Systems, Inc. introduced a distributed processing system, the System IV/50 at NCC, confirming its view that the small business systems market is a viable one.

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Semi-Intelligent Units Undergoing Price War

(Continued from Page 47)

ogy advances, the mill costs go down, but the overhead costs rise, he said. "It's got to reach a point of equilibrium," he added.

"As the technological state of the art catches up with our part of the industry, the cost of semi-intelligent terminals should go down within four months," Terry of LSI said.

By 1977, firms will have to offer a microprocessor version of CRTs or they won't be able to stay in business, he said.

Demand for semi-intelligent terminals is increasing, several agreed.

CW Photo by M. Upton

John A. Hill

The growth is coming in the upper end of LSI's line, Terry said, which accounts for half the firm's shipments and two-thirds of revenues.

Beehive is expanding its product line in both the low and high end, De Forest observed, with the new models B 100, 500 and 800.

TEC's hottest product is a unit that sells for $1,500 in OEM quantities and is above a dumb terminal, but has no editing capability, Hamilton said. The unit has a movable cursor and is a buffered machine, he said.

Third-Party Lessors Invading IBM's Japanese Market

TOKYO – The invasion of major third-party computer leasing companies into IBM's user market here may be a bitter pill for the giant to swallow, according to *EDP/Japan Report* (EDP/JR).

The appearance of third-party leasing firms means IBM Japan will have to maintain all its systems which are leased by those firms; in addition, the prices of IBM systems will have to be cut to cope with price competition from the third-party lessors, EDP/JR said.

In a preliminary move to combat advances by the lessors, IBM Japan has started offering a three-year Term Lease Plan (TLP) to its 370 series users; the newsletter noted.

The adoption of a three-year TLP rather than the four-year TLP in Japan will also help combat the intensifying competition IBM Japan is facing from Fujitsu and Hitachi with their M series computers, according to EDP/JR.

Making Presence Known

In the past, third-party lessors have been discouraged by the number of restrictions imposed by the Japanese government. Itel, however, has been operating in Japan through its local partner, Showa Information Systems, since 1973.

This year, several others will join Itel.

Greyhound Computer recently started marketing IBM 360s and low-end 370s through a Japanese computer leasing firm, Computer Consultants, Inc.

The main target market for the Greyhound systems will be medium-to-small-sized firms which have enough business volume to justify IBM 360 systems, as well as large companies which will use 370s as backup systems, EDP/JR said.

At the other end of the scale, Continental Information Systems, Inc., is planning to distribute 370/145s, 370/158s and probably used 360 systems.

The firm, EDP/JR reported, is said to have reached a basic agreement with Nippon Computer Co. and is engaging in the leasing of IBM disk packs, data modules, modems and converters.

Finally, National Computer Rental, a subsidiary of Flying Tiger Corp., is presently negotiating terms with a Japanese leasing firm.

Two Factors Important

In order to venture into the third-party leasing business, at least three resources are necessary:

- Financial resources to support operating lease services.
- Marketing forces to sell leasing services.
- Field engineering service to maintain installed systems.

Since IBM will be obligated to maintain all of its installed systems, leased or otherwise, third-party lessors will be concentrating on the other two prerequisites, primarily on locating good financial support to initiate operation of a leasing service, according to EDP/JR.

This is a problem in Japan since the depreciation plan of seven to eight years which is still common in some Western countries is difficult to apply to the market here for three reasons.

First, the average length of use for a computer system in Japan is a relatively short period of 40 months.

Second, most Japanese users tend to want "new" equipment, making it difficult of re-lease or resell returned computers.

And, finally, insurance systems do not exist which insure the risks accompanying the cancellation of a leasing term by a user.

This means the third-party lessors must apply the shorter legal depreciation term of six years, making it necessary for them to find backers who will provide funds with the lowest possible interest rates.

This, in turn, will keep the leasing price at the lowest level – necessary in order to compete with the computer manufacturers' rental prices, EDP/JR said.

"Industrial sources estimate that users of third-party leased computers should be able to win cost advantages of 40% to 50% for 360 series computers and 15% to 25% for 370 systems with a minimum commitment of four years," according to EDP/JR.

Expansions

Incoterm Corp. is planning to move its corporate headquarters to Wellesley, Mass., by July 1. It is also relocating its southeastern regional office and branch office to expanded facilities in McLean, Va.

Xerox Computer Services has moved to larger quarters in Rochelle Park, N.J.

Computer Transmission Corp. has expanded its manufacturing facilities in El Segundo, Calif.

Management Assistance, Inc. (MAI) will expand its existing facility at Houston, Texas to operate as Genesis One Products Corp., an MAI company. Production facilities will be expanded by 30%.

Burroughs Corp. has leased 9,600 sq ft of office and warehouse space in Irvine, Calif.

MDB Systems, Inc. has expanded three times in size with the purchase of new facilities in Orange, Calif.

Xbec Systems, Inc. has moved to 2985 Kifer Road, Santa Clara, Calif. 95051.

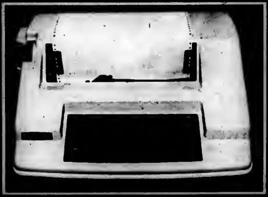
The Kennedy Co. has established a European service center and parts depot in Zeist, Netherlands under the auspices of Datacare.

Logic Share, Inc. has leased a 3,000 sq-ft building for offices at 4023 Birch Ave., Newport Beach, Calif.

Management Science America, Inc. has moved its recently acquired Management Information Service and the Alltax tax calculation package operation from Ramsey, N.J., to Atlanta, Ga.

Executive Corner

- E.H. Van Hoesen has been appointed president of IBM's Information Records Division.
- Norman A. Fletcher has been named president of Computer Peripherals, Inc., a firm jointly owned by NCR, Control Data Corp. and ICL Ltd.
- Rowland H. Thomas Jr. has been named vice-president of product marketing at Data General Corp.
- James Gafke was promoted to executive vice-president of the Computer Products Division of Itel Corp's Data Products Group.
- William N. Stirlen has been named vice-president of corporate development for Computer Consoles, Inc.
- Michael H. Smith has joined CRA, Inc., a Phoenix-based sales and service firm, as vice-president of equipment leasing and financing.
- David V. Ragone has been named to the board of directors of Sycor, Inc.
- William A. Boss has been named vice-president/director of marketing support for Pansophic Systems, Inc.
- David I. Caplan has joined Inforex as vice-president of engineering.
- Russell Gerns has joined Cipher Data Products, Inc. as vice-president of operations.
- Digital Equipment Corp. has appointed four new vice-presidents: William C. Hanson, volume manufacturing; Henry P. Lemaire, component manufacturing and engineering; Edward A. Schwartz, secretary, general counsel; and John F. Smith, systems manufacturing.
- Philip Present has been named vice-president of marketing for business systems products at Olivetti Corp. of America, where E.W. Grossman was named vice-president of customer engineering service.
- John W. Brackett has been named president, director and chief executive officer of Softech, Inc.
- Vincent S. Balhorn has joined Data 100 Corp. as vice-president of field engineering. Steven J. Shamblott was promoted to vice-president of sales.
- Edward P. Gistaro was elected to the board of directors and John R. Walker was elected senior vice-president of operations of Datapoint Corp. In addition, John M. Cochran, Richard V. Palermo and Daniel Hosage were named Datapoint vice-presidents of customer service and marketing administration, corporate development and special marketing programs respectively.
- Rene L. Eris has been appointed president and Stephen V. Tritto vice-president of marketing at Carter Associates.
- Paul K. McCarrick has been named vice-president of Autex, Inc. and will head the Field Operations Department.
- Paul J. Rizzo, a senior vice-president, group head and director of IBM Corp., has been nominated a director of Continental Illinois Corp.
- Robert N. Brown has been elected vice-president of engineering and Milton Sanders has been named vice-president of marketing at Electronic Associates, Inc.



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Big Market Seen in Algeria

WASHINGTON, D.C. – Talks between Algerian and U.S. government and industry officials here have disclosed a multi-million-dollar market for American manufacturers of DP equipment in Algeria, according to the U.S. Department of Commerce.

Algeria's National EDP Authority is preparing a five-year computer development plan to be published later this year which will focus on the development of management information systems for industrial, commercial and agricultural uses.

The Algerian Authority is seeking technical assistance from U.S. firms for systems design, training and, eventually, development of local DP manufacturing for domestic consumption, according to Commerce.

U.S. firms interested in Algeria's DP development program may write – preferably in French – to the Commissariat National a l'Informatique, 4 Blvd. Mohamed V, Algiers, Algeria.

U.S. Firms Seeking Japanese Reps

TOKYO – Five American companies are seeking Japanese agents to import and sell their products and help in local leasing of computer equipment, according to an article in *The Japan Economic Journal*.

The companies are Delta Data Systems Corp. of Cornwells Heights, Pa.; Continental Information Systems Corp. of Syracuse, N.Y.; Advanced Systems, Inc. of Elk Grove Village, Ill.; Courier Terminal Systems, Inc. of Phoenix; and National Computer Rental Ltd. of New York, N.Y..

The companies' decisions follow Japan's liberalization of its DP industry and DP import industry last December, according to the newspaper.

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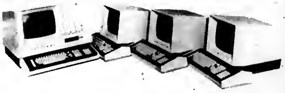

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International News

Philips Bridges System Gap With P410

EINDHOVEN, The Netherlands – Philips Data Systems has unveiled the P410 system which handles transaction and batch processing simultaneously, it said.

The system represents the midpoint between the firm's 300 line and its larger systems.

Main memory ranges from 16K to 64K of core with a cycle time of 1.5 µsec. The 6K control memory contains 40 bits of read-only memory.

The accompanying disk drive includes one fixed and one removable cartridge disk.

The main cabinet is divided into two parts, one with the keyboard and 32-character display that prompts the operator and paper handling. The other has internal peripherals and adapters for external peripherals, the firm said.

The system also includes a 100 char./sec dot matrix printer.

Magnetic ledger card processing is available as an option, allowing 320 users a smooth upgrade, according to Philips.

Currently the system can process two programs simultaneously and this capability may be extended to four programs, the firm said. One cassette station is standard on the P410 and up to four are offered.

The I/O system can handle up to 16 local and remote peripherals. Four dual disk drives, two line printers of 70- to 200 line/min, a card reader and card punch can be connected locally, the firm said.

Initially the system will be available with one inquiry station; the firm plans to offer up to four stations in the future.

The P410 can be finked to other CPUs in a distributed network, Philips said.

A library of modular programs is available for use on the 410 and individual programming can be done in Cobol, scientific Basic and Ideal, the firm said.

Politics Blamed

British Rail Shelves Reservations Plan

By Ivan Berenyi

Special to Computerworld

LONDON – British Rail (BR), which is now facing record losses, has decided to postpone indefinitely its long-running computerized seat and sleeper reservations project.

An attempt is being made to blame this decision on loss-cutting economies, but in fact it stems from political interference.

The projeot's high point was 1974, when bids were invited and received from IBM, Univac and Britain's International Computers Ltd. (ICL). The British bid was based on its 2900 system, at that point not even officially in existence, and an operating system called System B, which observors said was unsuitable for a transaction-oriented environment.

ICL's bid was also the most expensive of the three, so BR's DP team rejected it in favor of a dual-processor Univac 1110 configuration.

That was its undoing, for BR had only the previous year demanded and obtained a free reign to specify hardware for its version of Tops, the freight wagon control system designed by IBM and Southern Pacific.

That order predictably went to IBM, and the UK Department of Industry had to sit back and watch a nationalized enterprise channelling $32.5 million in hardware and software costs almost entirely to the U.S. as the first half of the Tops budget.

Faced with the prospect of another $32.5 million going abroad on the reservations system, the Department of Industry, which funds ICL, dug in its heels and put pressure on the Department of the Environment (DOE), BR's sponsor, to make the rail network buy British.

Meanwhile, steeply rising ticket prices on the railway had created customer resistance, slowly eroding the basis of BR's calculation that reservations would rise tenfold in six years. The DOE used this as an excuse to force BR into a "full reexamination" of the whole scheme.

BR then asked Univac to produce a scaled-down version of the reservations system, this time based on either a single 1110 or even an 1106 – what the railway termed an "interim solution."

But the delay gave ICL time to come up with a new bid based on a 1.5M-byte 2970, officially annouced by then and equipped with the newly developed System D (and later an improved version called System T) operating system.

BR was still not impressed, however, and put its revised Univac proposals to the DOE in mid-1975, already accepting that the 1977 start-up date (itself revised from the original 1974 target) would have to be scrapped.

The government proved equally adamant, however, that the order should not go to Univac, which (unlike IBM, Honeywell, NCR, etc.) does not even have a UK manufacturing plant. A stalemate ensued.

Now BR management has agreed to postpone the whole project for an indefinite period. It will, it said unofficially, be reviewed annually.

This leaves BR in the position of being the only major rail operator in the world (except for Indian Railways) which has neither a computerized reservations system or firm plans for one.

CMC Expects Orders For Korean Systems

SEOUL, Korea – At least another 10 CMC 5 systems will be ordered in this country this year, according to W.B. Lee, president of Jyoni Business International, distributor of Computer Machinery Corp. (CMC) products in Korea.

CMC International's recent three-day show here was attended by about 100 persons, evidence of increasing interest in key-to-disk and key-to-tape data entry, he said.

Flying Disks

A number of U.S. companies are finding it more convenient and economical to air freight magnetic disks and tapes rather than the more bulky punched card decks, CMC said.

Historically, U.S. companies have sent source information to Korea for keypunching into cards.

Orders for two CMC 5 systems with 10 keystations each have been received from Korea.

Foreign Orders & Installations

Burroughs Wins Order For $20 Million in UK

LONDON – Midland Bank Ltd. has ordered two large-scale B7700 systems from Burroughs Machines Ltd. for a combined value of about $20 million.

Each B7700 will be equipped with four central processors and replace B6700 dual-processor systems currently serving 2,300 Burroughs terminals in branches throughout England and Wales.

The first B7700 will be delivered this year, the second in 1977.

Other Awards

Schiphol Airport in Holland has installed two Model 3403 controllers and two Model 3016 rotating memories from Vermont Research Corp. as part of a departure control system.

Southampton College of Technology in England has ordered a Teacher One Model 4 computer system from Computer Technology Ltd. to teach students programming and DP.

The University of Manchester in England has ordered T800 tape transports and D3000 twin disk operating units from Pertec Corp.

Tokyo Tanabe Seiyaku Co. Ltd. has ordered a Univac 90/60 for production and material control.

The Postal and Telecommunications Ministry of France has ordered its third letter-mail reading and sorting system from Recognition Equipmt, Inc.

Barclays Bank International Ltd., has ordered two NCR 643 computer output microfilm units.

Several Elements Key to TRW's Place in POS Market

Special to Computerworld

HAWTHORNE, Calif. – TRW's recent introduction of a point-of-sale (POS) terminal is but one element contributing to the firm's position in the POS marketplace, according to Richard A. Campbell, vice-president and general manager of TRW Communications Systems and Services.

Recent news about TRW's POS business has concentrated on the release of the terminal system [CW, May 31] and an agreement with the Singer Co. under which TRW will perform the maintenance and customer support functions for Singer's Business Machines Division's North American Marketing and Services operations.

"We've been supplying advanced interactive POS systems for two years," Campbell said. "The POS cash register is just an element.

"Another key element is the communications system that links the POS terminal and the many other data entry points into a cohesive, cost-effective system. TRW's experience in this area is one big reason major retailers are talking to us," he added.

Another reason, Campbell said, is TRW's market position.

"We are known primarily as a communications system supplier. As such, TRW is unique because we can hook up whatever terminals the retailer wants and work with whatever central computer he uses," Campbell said.

"In doing this, we emphasize reducing costs and improving the reliability of the retailer's data communications system," he added.

TRW has an edge in communications, he said, noting that, "between our retail POS, credit authorization, check-cashing and banking systems, TRW has over 60,000 interactive communications terminals in operation."

Financial Ability

On the question of TRW's financial ability to continue fulfilling its commitments to retailers, Campbell acknowledged TRW is making a substantial investment in the business and start-up costs have deferred profits in the POS area.

"The company is operating under a carefully laid out long-range plan that identifies the importance of the program and highlights objectives and milestones for TRW management," he said.

"This stress on planning and control has been a major factor in TRW's successful management of new business programs with a high advanced technology content over the past 20 years. A key part of this is knowing in advance the investment that will be required," he stated.

In Campbell's view, TRW's customer base and product strategy are both important in measuring the company's posture and potential.

"We've taken a building-block approach in introducing retailers to real-time communications systems," he said.

"We've introduced credit authorization systems in 50 major department store companies over the past five years. This has been a high payout application.

"Once a store establishes a communications system for TRW credit authorization terminals, the same communications lines can be used to support POS terminals," he observed.

As a result, TRW anticipates much of its future market will come from stores already served by TRW in some way. And, in many cases, TRW terminals and minicomputer-based communications systems will be used along with terminals from other manufacturers – all sharing the same data communications lines.

One other major goal for TRW is to help retailers and financial institutions work together toward making the electronic transfer of funds practical. TRW has already helped start point-of-sale electronic funds transfer system for Glendale Federal Savings and Loan in California, Campbell said.

"TRW is working toward communications systems that involve financial institutions, retailers and supermarkets," he said. "Our internal organization of communications systems resources reflects this goal."

TRW is now developing retail and financial communications systems from a common technological base and will benefit from economies of sale in the development, manufacturing and customer service areas, he added.

Contracts

National CSS, Inc. has received a two-year, $4.2 million service contract from Pacific Telephone and Telegraph Co. to provide a dedicated interactive system consisting of an IBM 370/158 and including support personnel.

Kennedy Co. has received a $500,000 add-on contract from Spectron Corp. for Model 331 digital cartridge recorders to be used in Spectron's Datascope test instrument.

Raytheon Service Co. has received a five-year contract from Cambridge Memories, Inc. (CMI) to be the sole provider of field maintenance services for CMI end-user products in the U.S. and Canada. The contract gives Raytheon more than 500 new customers with an installed base of equipment valued at about $30 million.

Pertec Corp.'s Peripheral Equipment Division has been awarded a supplies contract from Micro Instrumentation and Telemetry Systems, Inc. for both rigid and flexible disk drives under an OEM agreement estimated at about $690,000.

Wiltek, Inc. has signed a contract with Amstar Corp. for a nationwide communications network of Wiltek 11 terminals controlled by the Wilcom Communications Computer Service.

Zentec Corp. has received a contract from Technicon Medical Information Systems Corp. for Zentec's 9000 series terminals to be used in the Technicon Medical Information System.

Shugart Associates has received a multiyear $1.6 million contract from Data 100 Corp. for delivery of SA800 floppy disk drives to be used in Data 100's Model 77 key/diskette systems.

Systematics, Inc. has received a facilities management contract from Independent Bankshares Corp. for establishment of a four-bank DP center to provide services.

Burroughs Corp.'s Federal Special Systems Group has received a contract from the U.S. Air Force for a B6750 system and 78 on-line remote terminals which will be used in Armed Forces Examining and Entrance Stations and U.S. Recruiting Group and service installations. The contract is estimated at $4.3 million.

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The Course Work

Roy Freed, the seminar leader, will review all types of contracts impacting computer use, including:

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- and others

In addition to a basic review of the laws regulating DP contracting and taxation, you'll learn how to apply the legal rules in a positive way to gain advantage for yourself. And *bring your own contracts, because they will be an important part of the course work.* All registrants are invited to bring their contract forms to the seminar for discussion and review to the extent feasible.

In the workshops you'll gain practical experience with the techniques under study. You'll learn, for example, how to recognize opportunities to negotiate; how to establish performance goals and conditions while you can still do something about it; how to avoid costly litigation and resolve disputes; and how to achieve significant tax savings through the proper structuring and wording of contracts. Plus, you'll gain valuable experience with techniques for handling any transaction. Overall, you'll have an excellent chance to learn a great deal in a short time, as many of our earlier participants have found:

"This seminar will provide me with an ability to evaluate future contracts and renewal contracts for refinement purposes. This course has been excellent."
F. Ford, Entrex, Burlington, Mass.

"I considered this to be a very good fundamental review of basic problems associated with EDP contracting."
J. M. Aubry, Canadian Government

"This was an exceptionally well organized seminar. The material presented was significant and useful. This seminar would be of great practical value to someone without computer contracting experience as well as serving as a useful outlet and review for those with more background and experience."
William C. Prinn, Director, Advanced Planning
Chessie System, Baltimore, Md.

"I had no idea that we would have the opportunity to communicate so closely on an informal basis. That, combined with your excellent preparation, made this experience the most rewarding seminar experience I've had. I commend you for what I regard as a most worthwhile seminar, and thank you for your genuine interest in communicating with, and not merely to the participants."
SV, Attorney, Worcester, Mass.

"The appropriateness of this seminar is extremely important. This area of the Computer Science field has generally received little or no attention from user, vendor or the legal professions."
D.J. Connelly, Development & Control Manager
Norton Company, Worcester, Mass.

Roy N. Freed Is the Seminar Leader

Roy N. Freed is internationally known for his acuity and expertise in this field, and he will personally direct the entire seminar. A graduate of Yale Law School, Roy has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private corporate practice in greater Boston with the firm of Pollock, O'Connor and Jacobs. He teaches at Boston University Law School, and has written many articles on this subject, including "Computer Fraud, a Management Trap" (Business Horizons), and "Get The Computer System You Want" (Harvard Business Review). He is the author of the book, *Computers and Law — a Reference Work*, now in its fourth edition, and he also edited the complete, extensive course materials used in this seminar.

Charges and Enrollment

The charge for the entire 2½ day seminar, including continental breakfasts, luncheons, and all course materials is $325 per registrant. Additional registrants from the same company are charged only $275. This does not include hotel rooms, if necessary, but we have reserved space at the seminar hotels for attendees who wish them.

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Military Mini Maker Aims For Bigger Market Share

By Esther Surden
Of the CW Staff

CUPERTINO, Calif. – Rolm Corp., maker of ruggedized minicomputers primarily marketed to the military, intends to get into the industrial marketplace in a bigger way, according to Pat Groves, computer product line manager.

The firm was established in 1969 to provide ruggedized minis and acquired a software license from Data General Corp. (DG). The entire Rolm line is compatible with DG Nova software, Groves said in an interview here recently.

Rolm recently added a minicomputer-controlled PBX system to its product line; most of the firm's expansion is taking place within this product line, he said.

In the future Rolm will also aim at the business-oriented marketplace. A third product line, less expensive than the minicomputer line it produces for the government and based on microcomputer technology, will be developed.

The firm will then deal directly with businesses and small customers. For the moment, much of its minicomputer business is OEM except for the industrial users.

Unsatisfactory Customer

"I think that no one who sells primarily to the government is very satisfied with that situation because all money that comes from the government can be politically controlled," Groves said.

In addition, the Renegotiation Act, which says the government can look at all books of companies selling exclusively to the government, can be disquieting, he said.

For the fiscal year ending in June, sales for the company will be about $12 million, Groves said, and within a few years the PBX and computer sales should be about equal.

"Our approach in the business has been to sell to research and development projects and not to large procurement contracts," Groves said. Thus the mini business is mainly in single or small quantity sales.

However, within the next two years, the firm expects some of the R&D projects to develop into large contracts.

Groves estimated about 2,000 Rolm ruggedized minis are out in the field at the moment, with the firm's 1601 representing more sales than any other item.

The firm provides a catalog of systems and peripherals, and users buy right out of the catalog.

No Eclipse Compatibility Yet

Rolm hasn't developed an Eclipse-compatible system yet, Groves said, because Data General is protective of its Infos and Fortran V software for the Eclipse and has never released the source code.

"We cannot use its software without the capability of modifying it," Groves said.

Reliability is the keyword in the rugged mini game, Groves said. The firm's mean time between failure is 8,000 hours, he said.

"A lot of companies think the way to get reliability is to use very expensive, high-reliability parts. Rolm uses good commercial parts" and takes care in assembly, he said.

After the assembled parts are put through 50 to 100 hours of testing that includes a shake table and "ovens," the systems are then put together with their peripherals and then undergo more testing before the configuration is shipped, Groves said.

Orders & Installations

Randall's Food Market of Houston has installed Sweda's Series 600/80 electronic point-of-sale system.

First Federal Savings & Loan Association of Dallas has ordered a Univac 90/60 to provide on-line processing capability for 30 branch offices.

Southern Statea Cooperative, an agricultural association, has ordered 250 NCR 250 electronic cash registers and magnetic tape cassette recorders, 100 NCR 210 electronic cash registers and an NCR 725 minicomputer.

The American Animal Hospital Association of South Bend, Ind., has installed a Burroughs B700 system to maintain membership information.

The *Great Falls* (Mont.) *Tribune* has ordered a Harris 2550 copy-processing system, including 17 editorial terminals, from Harris Corp.

The American National Bank of Bakersfield, Calif., has ordered three Diebold, Inc. Total Banking Systems as part of its 24-hour banking service.

The Bethlehem, Pa. *Globe-Times* has ordered a dual Typeset-11 computer system from Digital Equipment Corp.

The General Servicea Administration is installing NCR point-of-sale equipment in its 80 self-service supply stores. The equipment includes 85 NCR 250 electronic cash registers and 12 NCR 747 tag and label printers.

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The Mid-Illinois Computer Cooperative (MICC) a computer network providing timesharing and remote batch academic computing services to five state universities, seeks applications for the position of Executive Director. MICC operates a Control Data Cyber 72 computer system under KRONOS operating system on the campus of Southern Illinois University at Edwardsville. Other members of MICC include Eastern Illinois University, Illinois State University, Sangamon State University and Western Illinois University.

The Executive Director is the chief operating officer of MICC and reports to the MICC Operating Board. Minimum qualifications for the position include a Ph.D. degree and five years of progressively responsible experience in the management of an academic computing facility or an equivalent combination of education and experience. Salary range if $24,000 to $28,000 annually. Deadline for receipt of applications is June 21, 1976. Applications should be sent to:

Dr. Warren Harden
Chairman, MICC Operating Board
Office of Institutional Research
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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080(, Fort Worth (817/338-9300), Houston (713/626-8705(, New Orleans (504/523-2576(.
West Coast: Los Angeles (213/386-5500(, Irvine, CA. (714/833-1730(, Palo Alto (415/328-7155), San Francisco (415/434-2410).

Data Processing

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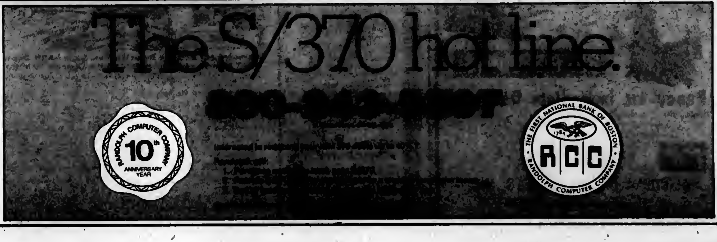
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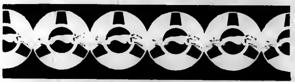

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Pertec Sets Records in Last Nine Months

EL SEGUNDO, Calif. —Pertec Corp. reported record earnings and revenues for the nine months ended March 26, the close of Pertec's 1976 fiscal year.

Although revenues rose 15% in the Peripheral Equipment Division, the Business Systems Division experienced a downturn in revenues.

For the company, revenues rose 6% to $36.7 million compared with $34.5 million for the same period last year.

Earnings totaled $2.5 million or 78 cents a share compared with $1.8 million or 59 cents a share in the same 1975 period.

The results do not reflect the acquisition ot Computer Machinery Corp. (CMC) on March 30, the firm said.

During the last quarter, Pertec revenues dropped to $11.1 million compared with $13 million in the same period last year.

Earnings dipped to $858,000 or 27 cents a share compared with $859,000 or 28 cents a share in the same year-ago quarter.

Regarding the downturn by the Business Systems Division, Pertec President Ryal Poppa said, "As we indicated in our first- and second-quarter reports, we had anticipated a downturn in sales to occur in the latter part of the year, accompanied by a consequent reduction in the level of profitability. This downturn occurred as expected.

"Most of the negative impact on earnings will occur in the first two quarters of fiscal 1977. On the brighter side, we now see signs of recovery and are expecting a return to a higher level of profitability in the latter part of fiscal 1977" in the Business Systems Division, he said.

"For some period of time we have been concerned about the Business Systems Division and its reliance on a few major customers. The acquisition of CMC provides Pertec with an in-place, end-user marketing organization and service force which will help reduce the dependence of the Business Systems Division on a few large private-label contracts," he said.

"We are now more able to control our own destiny in the end-user marketplace, which we believe will stabilize the future of the division and enhance the future growth of Pertec."

Decision Data Sees Poor Half-Year As '75 Losses Total $8.4 Million

HORSHAM, Pa. – While forecasting losses during the first and second quarters of 1976, Decision Data Computer Corp. revealed an $8.4 million loss for 1975.

That figure included $7.5 million in losses of a nonrecurring nature, such as adjustments in depreciation rates, inventory reserves and other write-offs, the firm said.

The $8.4 million loss, or $2.25 a share, compared with earnings of $1.5 million or 40 cents a share in 1974.

Revenues during the year slipped to $39.7 million compared with last year's $40.6 million.

Winfield Shiras, acting chief executive officer, said the general economic recession of 1975 brought about a significant reduction in sales to OEMs and was the major factor in the company's unfavorable results, both for last year and the first part of 1976.

The company has had to reduce manufacturing operations, he added.

Shiras predicted a loss of about $1 million for the first quarter ended Feb. 28, 1976, as well as a loss for the second quarter.

"Despite the severe setback, the company is on a course which will lead to improved operating results by the end of the year," Shiras stated.

The firm's banking group has agreed, subject to final documentation, to advance $2.1 million for working capital requirements as part of the restructuring of the company's loan commitment.

Milgo Electronic Net Cut in Half Compared With 1975 Six Months

MIAMI – Milgo Electronic Corp.'s earnings dropped in half for the second quarter and six months compared with those of the year-ago periods ending March 31.

For the quarter, earnings declined to $545,000 or 31 cents a share compared with $1.2 million or 73 cents a share in the year-ago period.

Revenues were down to $9.8 million compared with $10.6 million in the same 1975 quarter.

The firm attributed the decrease in volume in the quarter to lower incoming orders as a result of the decline in general business activity.

Modem business lags behind the general computer industry, a spokesman said.

For the six months, Milgo's earnings fell to $905,000 or 52 cents a share compared with $2.4 million or $1.44 a share in the same period last year.

Revenues dropped to $18.9 million compared with $20.8 million a year ago.

Acquisitions

United Telecommunications, Inc. has agreed in principle to acquire Standard Computer Corp. (SCC) for 227,500 shares of common. United Telecom plans to integrate SCC operations with those of United Computing Systems, Inc. and International Timesharing Corp.

Data Devices International, Inc. has acquired Insphere, Inc., a manufacturer of disk cartridge maintenance equipment. The transaction was for cash and Insphere will be operated as a wholly owned subsidiary.

Globe Ticket Co. has acquired the Continuous and Snapout Forms Division of Florida Forms, Inc.

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Comshare has obtained a $2.65 million loan agreement with the National Bank of Detroit, of which $1.3 million is a revolving credit; the remainder is a term loan.

$$$

Wabash Magnetics shareholders have approved a change in the name to Wabash; Bradford Computer & Systems, Inc. has changed its name to Bradford National Corp.

$$$

Creditors of Western Digital have granted the firm a 30-day moratorium on payment of trade debt and appointed a seven-member creditors committee.

$$$

Burroughs will pay a quarterly dividend of 17 cents on each share of common payable Aug. 7 to shareholders of record July 9.

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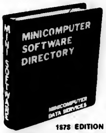

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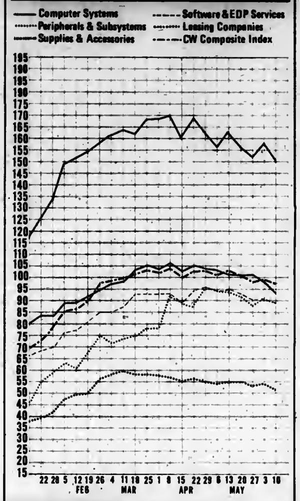

Earnings Reports

BASF AG
Year Ended Dec. 31

	1976 (000)	1975 (000)
Revenue	7,096,400	6,673,400
Earnings	147,900	204,600

a-Dollar figures computed at the mark's current rate.

BOOTHE COMPUTER
Three Months Ended March 31

	1976	1975
Shr Ernd	$.18	$.02
Revenue	12,069,000	9,589,000
Disc Op	.....	111,000
Earnings	697,000	59,000

BRADFORD COMPUTER & SYSTEMS
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.26	$.24
Revenue	18,686,000	17,200,000
Earnings	1,055,000	964,000

a-Restated to reflect retroactive increase in franchise tax rates.

BUNKER RAMO
Three Months Ended March 31

	1976	a1976
Shr Ernd	$.02	.....
Revenue	b63,293,000	$71,745,000
Tax Cred	515,000	.....
Earnings	807,000	(363,000)

a-Restated to reflect accounting change for foreign currency translations. b-Includes about $10 million credit from sale of system to the National Association of Securities Dealers in February 1976.

CODEX
Three Months Ended March 31

	1976	1975
Shr Ernd	$.50	$.73
Revenue	6,730,005	6,237,341
Earnings	786,572	1,106,544
6 Mo Shr	.78	1.45
Revenue	11,613,341	12,329,210
Earnings	1,233,050	2,183,201

COGNITRONICS
Year Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.34
Revenue	$3,691,929	4,942,656
Tax Cred	.....	244,000
Earnings	(575,189)	507,841

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 9, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	94	-5	-5.0
O	COMPUTER AUTOMATION	10- 19	13 5/4	-1	-6.7
N	CONTROL DATA CORP	18- 27	20	-1 1/8	-5.5
N	DATA GENERAL CORP	40- 60	48 5/8	- 7/8	-1.7
O	DATAPOINT CORP	24- 45	36 1/4	-1 1/4	-3.3
O	DIGITAL COMP.CONTROL	2- 4	3 3/4	+ 1/8	+5.4
N	DIGITAL EQUIPMENT	138-181	156 1/8	-7 5/8	-4.5
N	ELECTRONIC ASSOC.	2- 5	3	- 1/8	-4.0
A	ELECTRONIC ENGINEER.	7- 16	10 1/2	-4 7/8	-31.7
N	FOXBORO	28- 43	40 1/2	-1 7/8	-4.4
O	GENERAL AUTOMATION	5- 11	6 3/4	-1	-12.9
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	104 5/8	-3 5/8	-5.1
N	HONEYWELL INC	34- 56	42 5/4	- 5/8	-1.4
N	IBM	227-272	233 1/4	-4 1/4	-1.6
O	MANAGEMENT ASSIST	1- 3	1 7/8	- 1/4	-11.7
O	MEMOREX	18- 33	24	-4	-14.2
O	MICRODATA CORP	10- 26	19 5/8	+ 3/4	+4.0
O	MODULAR COMPUTER SYS	9- 15	11 1/2	0	0.0
N	NCR	24- 51	50 5/4	+2 5/8	+8.5
O	PRIME COMPUTER INC	4- 11	8 1/4	-1	-10.8
N	PERKIN-ELMER.	19- 27	20 1/2	-1 3/8	-4.2
N	RAYTHEON CO	45- 56	55 5/8	+ 5/8	+1.1
N	SPERRY RAND	40- 50	46 5/8	- 5/8	-0.7
O	SYCOR INC	20- 51	24	- 1/2	-2.0
A	SYSTEMS ENG. LABS	6- 10	8 1/8	+ 1/8	+1.5
N	VARIAN ASSOCIATES	13- 17	13 5/8	- 7/8	-6.1
A	WANG LABS.	11- 20	11 3/8	- 1/8	-1.0

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	5 1/4	- 1/2	-8.6
A	COMMERCE GROUP CORP	2- 5	2 3/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	1 7/8	+ 1/8	+7.1
N	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/4	0	0.0
N	DPF INC	5- 7	3 5/8	0	0.0
A	GREYHOUND COMPUTER	3- 8	7	- 1/8	-1.7
N	ITEL	6- 15	11	- 1/2	-4.3
N	LEASCO CORP	6- 14	11	- 5/4	-6.5
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	1- 1	1/2	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/4	- 3/8	-4.9
N	U.S. LEASING	7- 12	8 5/4	- 1/2	-5.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/4	0	0.0
O	ANACOMP INC	9- 11	9	- 1/8	-1.3
A	APPLIED DATA RES.	2- 5	2 5/8	- 1/8	-4.5
N	AUTOMATIC DATA PROC	54- 68	66	-1 1/8	-1.6
O	COLEMAN AMERICAN COS	4- 6	3 1/2	0	0.0
O	COMPUTER DIMENSIONS	3- 7	4 8/4	- 3/8	-7.3
O	COMP ELECTION SYSTMS	5- 9	8 1/4	+ 1/2	+6.4
O	COMPUTER HORIZONS	1- 2	5/4	0	0.0
O	COMPUTER NETWORK	2- 6	4	- 1/4	-5.8
N	COMPUTER SCIENCES	4- 8	5 7/8	- 3/8	-6.0
O	COMPUTER TASK GROUP	1- 1	1 5/8	0	0.0
O	COMPUTER USAGE	3- 4	3 7/8	+ 5/8	+19.2
O	CONSHARE	2- 8	7 5/4	+ 1/4	+5.5
O	DATA DIMENSIONS INC	2- 4	5 1/4	- 1/4	-7.1
O	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	11 7/8	- 5/8	-3.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	2 1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1	0	0.0
O	KEANE ASSOCIATES	2- 4	5	0	0.0
O	KEYDATA CORP	3- 5	2 5/8	0	0.0
O	LOGICON	4- 4	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/4	0	0.0
A	NATIONAL CSS INC	15- 25	18 1/2	-1 1/4	-6.3
A	ON LINE SYSTEMS INC	18- 22	17 7/8	-1 5/8	-7.1
N	PLANNING RESEARCH	3- 3	5 1/4	- 1/8	-5.7
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	2 5/8	- 1/8	-4.5
O	REYNOLDS & REYNOLD	13- 21	17	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	5/4	0	0.0
O	TYMSHARE INC	19- 28	25 1/2	-2 5/8	-9.1
A	URS SYSTEMS	5- 5	5 7/8	- 1/8	-5.1
N	WYLY CORP	3- 7	5	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	8 3/4	- 1/8	-1.4
O	ADVANCED MEMORY SYS	4- 10	7	0	0.0
N	AMPEX CORP	5- 8	7 1/4	0	0.0
O	ANDERSON JACOBSON	2- 4	3	0	0.0
O	APPLIED DIG DATA SYS	13- 24	25 1/2	+1	+4.4
O	BEEHIVE MEDICAL ELEC	3- 8	7 1/2	+1 1/4	+20.0
A	BOLT, BERANEK & NEW	7- 10	8 1/4	0	0.0
N	BUNKER-RAMO	5- 7	5 7/8	0	0.0
A	CALCOMP	4- 7	4 1/2	0	0.0
O	CAMBRIDGE MEMORIES	2- 6	5 1/8	- 1/8	-5.8
N	CENTRONICS DATA COMP	20- 56	29 7/8	+1 1/4	+4.3
O	CODEX CORP	22- 42	30	-5 1/2	-13.4
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 3/8	0	0.0
O	COMPUTER CONSOLES	4- 7	6 1/4	- 1/4	-3.8
A	COMPUTER EQUIPMENT	1- 3	1 3/4	- 1/4	-12.5
O	COMPUTER TRANSCEIVER	1- 3	1 1/8	- 1/8	-10.0
O	COMTEN	4- 9	6 1/4	- 5/8	-9.0
N	CONRAC CORP	20- 25	20 1/2	- 7/8	-4.0
O	DATA ACCESS SYSTEMS	1- 4	3 1/2	- 1/4	-6.6
O	DATA 100	7- 13	9 7/8	- 1/2	-4.8
A	DATA PRODUCTS CORP	5- 11	9 1/4	0	0.0
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC	1- 2	2 1/8	+ 1/8	+6.2
O	DECISION DATA COMPUT	1- 4	1 7/8	+ 1/8	+7.1
O	DELTA DATA SYSTEMS	1- 1	5/8	+ 1/8	+25.0
N	ELECTRONIC M & M	1- 3	2 3/8	- 1/8	-5.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 1/4	- 5/8	-6.5
N	HARRIS CORP	34- 48	44 1/2	- 3/8	-0.8
A	INCOTERM CORP	9- 20	9 7/8	- 3/8	-3.6
O	INFOREX INC	5- 7	4 3/8	- 1/8	-2.7
O	INFORMATION INTL INC	10- 18	13 5/8	- 7/8	-6.0
O	INTEL CORP	65-109	66	-3	-4.5
A	LUNDY ELECTRONICS	4- 7	5 7/8	- 5/4	-16.2
O	MSI DATA CORP	3- 7	5 1/2	- 1/8	-2.2
A	MILGO ELECTRONICS	15- 20	19 1/2	- 3/8	-1.8
N	MOHAWK DATA SCI	8- 7	6 1/4	+ 1/4	+4.1
O	PENRIL CORP	1- 5	2 1/8	0	0.0
A	PERTEC CORP	5- 8	5	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	3	+ 1/2	+11.1
O	QUANTOR CORP	4- 5	4	- 1/8	-5.0
O	RECOGNITION EQUIP	6- 11	8	- 7/8	-9.8
N	SANDERS ASSOCIATES	4- 11	8 3/4	- 1/2	-3.4
O	SCAN DATA	2- 4	2 1/4	- 1/8	-5.7
O	STORAGE TECHNOLOGY	9- 15	10 5/4	-1	-8.5
O	T BAR INC	5- 10	4 7/8	-1 1/4	-20.4
O	TALLY CORP.	4- 6	5 1/8	+ 1/8	+2.5
O	TEC INC	3- 5	3 5/4	- 1/4	-4.2
N	TEKTRONIX INC	49- 65	56	-5 5/8	-4.0
N	TELEX	2- 3	3 1/2	- 1/2	-12.5
O	WANGCO INC	11- 22	18	- 7/8	-4.6
O	WILTEK INC	2- 2	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	2 1/4	- 1/4	-10.0
O	BALTIMORE BUS FORMS	4- 5	4	0	0.0
A	BARRY WRIGHT	6- 10	8	- 1/8	-1.5
O	CYBERMATICS INC	1- 1	5/4	0	0.0
A	DATA DOCUMENTS	35- 42	33	-2 1/4	-6.5
O	DUPLEX PRODUCTS INC	15- 24	14 5/4	-2	-11.9
N	ENNIS BUS. FORMS	6- 8	6 3/4	- 1/4	-3.5
O	GRAHAM MAGNETICS	8- 13	8 1/4	- 1/2	-5.7
O	GRAPHIC CONTROLS	15- 19	14	- 1/2	-3.4
N	3M COMPANY	33- 65	52 1/2	-2 1/2	-4.5
O	MOORE CORP LTD	42- 51	41 1/2	-2 1/2	-5.6
N	NASHUA CORP	11- 17	14 8/4	-1 1/4	-7.8
O	STANDARD REGISTER	16- 19	16	- 1/2	-3.0
O	TAB PRODUCTS CO	9- 8	7 5/4	+ 1/4	+3.3
N	UARCO	21- 25	21 1/4	+ 1/2	+2.4
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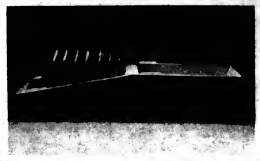

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